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RADIUM EMANATION IN CARCINOMA OF THE MOUTH AND THROAT*

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Inasmuch as we have had a fairly large experience in the use of radium in the treatment of carcinoma, we are prepared to recognize its shortcomings as well as to emphasize its virtues. It is our purpose to correlate our findings with those of other observers, and on the basis of this experience to attempt a statement of just how far one may expect to go with radium in the treatment of carcinoma of the mouth and throat under the limitations of our present knowedge.

This potent agent, having been in use for nearly twenty-five years with good, bad and indifferent results, is fraught with great possibilities for harm as well as good. To be used intelligently it must be fully understood from the physical as well as the physiologic side. A ray that can be detected by the electroscope after passing through twelve inches of lead is surely something worthy of wholesome respect. Yet in spite of this fact it is well known that radium is less effective and more dangerous in the treatment of deep-seated lesions than x ray, for two reasons: First, inasmuch as the intensity of the rays diminishes with the square of the distance, the maximum effect would be manifest in the healthy tissues through which they are supposed to act. Second, radium rays cannot be controlled as to direction because they emanate in all directions, thus scattering widespread instead of concentrating on the area treated. Therefore their effectiveness is most manifest only when the agent can be brought directly in contact with the lesion or buried within the structure, which explains why it has yielded its best results in the treatment of superficial lesions, such as those in regions under consideration in this paper.

First, let us consider the agent itself. Of the various emanations of radium the beta and gamma rays are the ones we attempt to employ, and in a general way it may be stated that the former act by causing inflammation leading to destruction of tissues *en masse*, while the latter exert a more selective action on the individual cell itself. The microscopical changes that take place consist of "swelling, hyperchromatism, vacuolar degeneration, and solution or fragmentation of nuclei, hydriopic swell-

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ing, vacuolation and solution of the cytoplasm. The surroundng stroma exhibits hyperemia, slight serous exudation, wandering of leukocytes, and growth of new capillaries which in many cases probably plays a part in the renewal of tumor cells." (Pfahler, Surgery, Gynec. and Obstet., October 1925.) In other

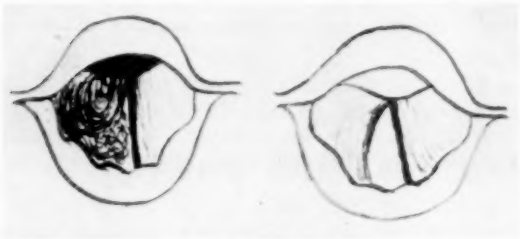

Fig. 1.—Drawing of carcinoma of larynx, treated with radium emanation. No recurrence in two years.

words, the gamma ray produces degenerative changes in the cell leading to its death, and also provides the necessary mechanism for its removel and elimination.

It should, however, be borne in mind that the effectiveness of radium varies according to the tissue exposed, some yielding readily and others offering stubborn resistance. Ewing (Mutter lecture, November 1922) states that "tumors derived from embryonal characters and retaining embryonal characters even when growing rapidly are, as a rule, particularly susceptible to radiation." He classifies them according to their radio-sensibility as follows

1. Lymphoma, lymphocytoma, lymphosarcoma, myeloma.
2. Embryonal tumors: carcinoma of testis and ovary. Basal cell carcinoma.
3. Cellular neoplastic adult tumors. Round-cell carcinoma. Diffuse carcinoma.
4. Desmoplastic tumors: carcinoma simplex, fitro-carcinoma, squamous carcinoma.
5. Adenocarcinoma: adenoma of uterus, intestine, breast.
6. Fibroblastic carcinoma. Osteocarcinoma, neurocarcinoma.

Fig. 2.—Specimen of extrinsic carcinoma of larynx involving pyriform fossa, epiglottis and pharynx

The truth of this statement has been well substantiated in our own experience as we have seen large fungating growths of the embryonal type completely disappear under one radium exposure, while comparatively isolated lesions of the squamous cell type failed to be influenced by repeated exposures and even took on more rapid growth under its inflluence. It is just in this latter type of growth that one must permit more of the beta rays to come into play in order to obtain a rapid destruction of the lesion through caustic as well as selective action. It is here that the question of screening and distance of the agent from the lesion comes to the fore. The proportion of beta rays acting upon the mass can be well controlled by the thickness and character of the screening material. This is only one of the factors that must be taken into consideration when deciding upon a plan of treatment in a particular case. We have also to bear in mind the location and extent of the lesion.

The methods of employing radium have undergone numerous changes since its early

days, and as our knowledge and experience increase they are bound to undergo further evolution. Where originally the radium salt was used, in later times emanation or radon has come into vogue and in a large number of instances has entirely supplanted the former. The great argument in favor of emanation is the smaller bulk of the containers, the possibility of distributing the agent more uniformly through the mass by implantation, and the smaller risk of financial loss through theft or loss of the particular amount used.

In lesions of the mouth and pharynx we have our choice of surface application or implantation. In the former we use the emanation tubes of from 50 to 150 millicuries, screened by 1 mm. of aluminum, or 0.5 mm. silver, 1 or 2 mm. of brass placed either in contact with the lesion or removed several centimeters, according to whether we desire intense local or more diffuse radiation. The duration of the exposure is from one to three hours, and may be repeated in two weeks if required. This is our method of choice in treating carcinoma of the lip and cheek. The tube may be imbedded in dental modelling compound moulded to the area and held between the patient's teeth.

The implantation method first employed in the form of needles, containing an average of 12 mgs., which were plunged into the mass, was later supplanted by the bare tubes of radium emanation, called "seeds" because of their size, containing from 0.5 to 4 mc. These tiny glass tubules offer practically no resistance to the beta rays and when planted throughout the growth lead to destruction *en masse*. These seeds having an effective radius of 1 cm. are plunged into the growth by means of a thick needle into which they are inserted, being expelled by an obturator and placed at points about 1 cm. apart. To successfully irradiate the entire growth it is necessary that its extent be recognized as far as possible so that the growing borders be not overlooked, a matter that is not always easily determined. The implants eventually are cast off with the slough, or else become encysted. More recently it has been found that by using gold implants whose walls average 0.5 cm. in thickness it is possible to screen out 85 per cent of the beta rays and thus prevent the extensive sloughing that follows the use of the glass tubes. The strength usually employed is about 2 mc. to the tube,

Fig. 3.—Portion of cricoid cartilage extruded into larynx following radium treatment. (Case cited in text.)

and it has been found that their action is more penetrating with less local reaction than is the case with the glass implants.

We employ the implantation method in lesions of the tongue, pharynx, and sometimes the larynx. In all cases it is advisable to thoroughly irradiate the neighboring lymphatic glands, whether enlarged or not, and for this purpose we use a tube of from 50 to 100 mc., screened with aluminum and brass, removed about 2 to 3 cm. from the skin and left in place over night.

Malignancies of the tongue and tonsil area are easily reached for implantation by direct inspection. Carcinoma of the tongue is particularly amenable to radium, especially if the lesion is located in the anterior half. As a rule, the nearer the lesion to the midline the more favorable the prognosis. One should by palpation attempt to estimate the depth of the infiltration so that the implants may be properly placed to take in the entire area. Our experience has been limited to the bare tubes, with which one must expect considerable sloughing.

After the mass has dropped out a cavity remains which slowly contracts as the epithelium of the tongue grows in to form its lining. It takes several months usually for the process to be completed, during which time the utmost cleanliness is desirable.

Statistics from the Memorial Institute of New York (Radium Report of the Memorial Hospital, 2nd series, 1923) show that of sixty-nine primary cases without glandular involvement 85 per cent were free from local evidence of the disease for periods ranging from two months to two years. Their total series of 148 cases, which included seventy with enlarged glands, most of which were inoperable, showed that 29 per cent were free from the disease for periods varying from three months to three years.

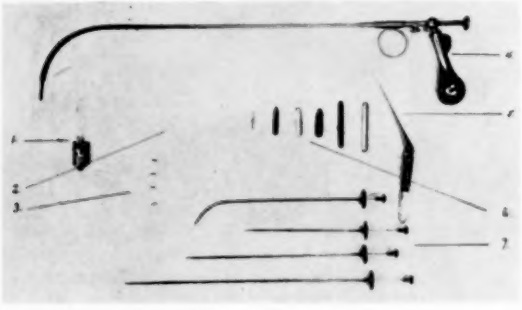

Fig. 4.
1. Ampule holding emanation seeds.
2. Glass emanation seeds.
3. Gold emanation implants.
4. Curved needle introducer.
5. Forceps for picking up emanation implants.
6. Various screens for emanation tubes.
7. Needles for introducing implants.

Simpson (Illinois Medical Journal, August, 1923) reports 60 per cent clinical cures in fourteen consecutive cases. The outlook in carcinoma of the tongue, therefore, is extremely optimistic, especially if the lesion is attacked early, before metastases have developed.

We cite the following typical case: A man, aged 60, who complained of a sore tongue of several months duration was found to have an indurated ulcer about 1.5 by 1 cm. on the dorsum in the midline, about 3 cm. from the tip, with considerable infiltration extending deeply into the body of the tongue. The Wasserman reaction was negative. Biopsy showed squamous cell carcinoma. There was slight enlargement of the submaxillary glands. The lesion was implanted with six radon tubes of 5 mc. each. A moderate reaction ensued, attended by considerable pain. The slough dropped out in two months. Healing was complete in four months and no recurrence has been noted up to the present time (2 years).

Carcinoma of the tonsil is not uncommon and is particularly dangerous because of the very early glandular involvement. The rich lymphatic supply of this region leading to the base of the tongue and the deep cervical glands accounts for the frequency with which the enlargement in the neck is noted even before the throat complaint.

A characteristic case of this type occurred in a man aged 48, who entered the hospital with a large mass in the right cervical area which was diagnosed as a tuberculous adenitis. The mass was enucleated and on section proved carcinomatous. Search for the inital lesion was then instituted, and an ulcerated, irregular, infiltrating mass was found in the right pyriform fossa reaching up to the base of the tongue. Biopsy showed carcinoma. He was treated by implantation with fifteen emanation seeds, totalling 7.5 mc. under suspension laryngoscopy. After a moderate reaction, with considerable pain referred to the ear, the lesion healed in about two months, leaving a smooth, white scar. The man was kept under observation for eighteen months, without the slightest sign of recurrence. At the end of that period he took sick with severe headache, facial paralysis and pains in the rectum. Two large nodules were found in the scalp which on removal and section proved carcinomatous. The original site of the carcinoma was still healed, with no local evidence of recurrence. At autopsy carcinoma

was found in the brain, lungs, mesentery and skin. This case illustrates not only how easily the original lesion may be overlooked in the first place, but also points out strikingly the long period of quiescence that may be enjoyed by the patient before metastases or recurrence will develop.

Nearly all carcinomas of the tonsil, base of the tongue and pyriform fossa are hopeless so far as surgery is concerned. Radium, however, offers considerable hope in such cases. Douglas Quick (Radium, July, 1923) treated 124 malignancies in this area, with clinical cures in 23 per cent.

The unfavorable features in the treatment of these lesions are the pain and discomfort attending the radium reaction and sloughing, as well as the danger of erosion into a large blood vessel with fatal hemorrhage. The latter can to a large degree be prevented by preliminary ligation of the lingual or external carotid artery.

The typical treatment consists of implantation of glass or gold tubes. If the lesion involves the base of the tongue the procedure is carried out by means of a curved needle introduced under indirect inspection with the laryngeal mirror. If the glands are involved and are not too densely attached to the deep structures of the neck they should be excised. The neck is then irradiated by well screened ampoules placed about 3 cm. from the skin. Direct implantation of the gland has, in our experience, proven unsuccessful because of the subsequent breaking down of the mass, with resulting discharging fistulae, secondary infection and extension into the skin and subcutaneous tissues.

A successfully treated case of this type was that of a man aged 57 who, about a year previously, had injured his throat through the accidental breaking off of a pipestem, which jammed against the back of his throat. He suffered severe pain for a time and was then apparently relieved until a few months ago, when the pain recurred. Examination revealed an ulcerating indurated excrescence involving the right tonsil and extending downward to the base of the tongue. The Wasserman reaction was negative and biopsy proved the growth to be carcinoma.

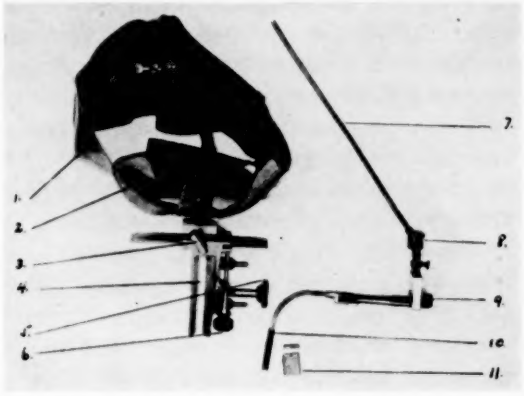

Fig. 5.—*Freer Aparatus for Intra-Laryngeal Treatment.*

1. Head band.
2. Rubber padding.
3. Screw adjusting lateral tilting.
5. Screw for tightening same.
6. Screw for lateral shifting of clamp.
7. Radium carrier (hollow) to be held in clamp (4.)
8. Screw to adjust angle of carrier.
9. Hollow tube to which suction is applied.
10. Screen carrier.
11. Silver screen for emanation tubes.

There was a small mass of glands present. The patient was treated by implantation of twenty glass seeds totalling 10 mc., reinforced by an overnight external radiation. Sloughing was extensive and pain severe for several weeks. The lesion healed, leaving a smooth scar. The pillars were both lost but the function of the palate was unimpaired. The condition has remained unchanged to date, a period of two and one-half years.

Carcinoma of the larynx may be considered under two heads, the intrinsic and the extrinsic, and the prognosis and treatment depend a great deal on an accurate knowledge of the best prognosis when treated by laryngectomy, (as shown by Mackenty, Archives of Oto-Laryngology, 1926) and radium should not be used in such cases. If the lesion is small and strict-

ly limited to one vocal cord, laryngofissure is the method of choice. If doubt exists as to the lesion being bilateral or extending beyond the midline, then laryngectomy only should be done. In cases that are extrinsic, surgery has little to offer because the lymphatic supply about the upper rim of the larynx is so rich that the spread of the carcinoma is only accelerated through the surgical trauma. Such cases may be deeply influenced and even cured by radium emanation. The greatest difficulty encountered in its use in this region arises from the perichondritis which frequently ensues with the radium reaction, often leading to necrosis of cartilage with prolonged abscess formation. Tracheotomy is nearly always required. However, surprising results sometimes occur which encourage us to continue our efforts in the hope of perfecting our technic so that the tissues may be adequately protected while at the same time thoroughly irradiating all of the lesion.

In a series of forty-six carcinomas of the larynx, twenty-six of which were extrinsic, we have four patients living and well today, five and one-half, five, four and one-half and two years respectively since the treatment. The last mentioned case was a very extensive fungating growth involving the right half of the larynx, with fixation of the cord. After a preliminary tracheotomy the growth was implanted with eight glass seeds, totalling 4 mc., and later was excised under suspension laryngoscopy. The base was again implanted with seven seeds (3.5 mc.) which produced considerable reaction leading to necrosis. A portion of the cricoid cartilage sloughed out and was removed through the Haslinger directoscope. The lesion healed completely, leaving a contracted scar occupying the right half of the larynx. The man has a rough, deep voice which is plainly audible at thirty feet, and up to the present time (two years) has shown no sign of recurrence.

The technic of intralaryngeal irradiation is varied. Freer's method is rather complicated and difficult for both physician and patient, as it involves the use of a heavy head piece for holding the radium carrier, and calls for perfect local anesthesia as well as accurate placement of the screen. It has the advantage, however, of bringing the agent directly in contact with the lesion without the trauma which the use of implants entails. It also offers the advantage of a screen which by filtering the beta rays lessens the chances of necrosis. Implantation of the growth with bare tubes or gold implants is of value only in cases where there is sufficient tissue to keep the implants at a safe distance from the cartilage. On account of the fact that the exact depth of the infiltration is seldom known, one is confronted with the dilemma of either too superficial or too deep an implantation, the former leading to recurrence and the latter to destruction of the cartilage. Each case, therefore, must be studied and the choice of method determined by the estimated depth of the lesion, as well as its type. Whichever method is used it must be supported by heavily screened external irradiation over the larynx.

In conclusion we should like to emphasize the following points:

1. A majority of the malignant lesions of the mouth and throat (including the strictly intrinsic carcinoma of the larynx) are inoperable.

2. Such cases, unless too far gone, are proper material for radium treatment.

3. The extent and type of the lesion must be carefully studied and an attempt made to thoroughly irradiate it along with its neighboring lymphatic glands.

4. Implantation with bare emanation seeds or the gold implants has proven satisfactory in our hands when the lesion is accessible and the surrounding structures capable of withstanding the reaction.

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MALIGNANT TUMORS OF THE PHARYNX AND LARYNX*

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In this talk I shall limit myself to malignant tumors of the nose, the nasal accessory sinuses, the pharynx and larynx.

In the first problem, we have to consider and contend with the mode of approach. With the use of radium that is a simpler matter than with the use of high frequency currents. It is easier to implant radium seeds with a needle than it is to approach a tumor in the antrum with an electrode. A tumor of the nose is very frequently a tumor involving one of the sinuses. The one most commonly involved is the maxillary antrum, and the tumor perhaps sarcoma.

It is obvious by the anatomic arrangement of the nose and nasal accessory sinuses that we cannot approach a tumor through the nose. It is necessary to expose the field for operation, assuming we are going to use surgical diathermy.

To expose the antrum for operation, it is necessary to make an incision in the mouth over the canine fossa, lift up the face, and remove the anterior wall of the antrum. Then we have our tumor exposed so that we may proceed.

The method which I have used and found satisfactory in some ways (and I will tell you later in what way) is the use of a d'Arsonval current for the coagulation of these tumor masses. The management does not differ from that of a tumor by coagulation anywhere else. There is the larger indifferent electrode on some part of the body, the abdomen or the back, and the active electrode in contact with the tumor.

I found early in practicing this method that a radical procedure is necessary, and where you may believe you have destroyed the tumor mass, you should not stop but go further. In other words, formerly, I was under the impression that the exposure of a tumor that may occupy some of the nose would require a small amount of current to destroy the tumor (1,000 to 1,500 milliamperes for a period of a minute or a minute and a half). Later I learned that it requires a great deal more curret for a longer period of time.

In the treatment of malignant neoplasms of the pharynx, such as the tonsil for instance, whether we use surgery, or radium, or x ray, or diathermy, we can hope for practically nothing, because in my experience and that of others, the results have been extremely poor. I believe that a malignant lesion of the tonsil is invariably fatal.

As we go further down and approach the larynx, it is a different story. We have a different anatomy to deal with. The malignant tumor in the larynx is closed in a box. The lower portion of the larynx has a lymphatic supply which is not good. Dr. Salinger said, "As you go higher toward the upper rim of the larynx, the lymphatic supply is rich and there the prognosis is not so good as in the lesions lower down near the glottis."

The approach of a malignant tumor of the larynx may be by laryngofissure. In the past in a number of articles which I have published, I have not advocated the use of the splitting of the larynx, opening it and treating the tumor directly. I have advocated the exposure of the larynx by means of the suspension apparatus as used by Lynch of New Orleans, but lately, I have operated on a few cases by laryngofissure, and while I still believe that you can get an excellent view of the larynx by laryngoscopy,

*Read at fifth annual meeting, American College of Physical Therapy, Chicago, Oct. 20, 1926.

properly done, I also believe that you can see and handle the tissues that you are dealing with a little better by direct exposure of the larynx.

The theoretical objection of doing laryngofissure is that the point of your metal instrument may incise the tumor that you are about to deal with, and it is generally conceded that any manipulation of a tumor by incision or pressure or rough handling in any way is not desirable. Metastasis may occur very rapidly in this way, but if one splits the larynx carefully and draws the wings of the cartilage apart with due care and some finesse, the tumor underneath within the larynx need not be damaged, and the operation is perhaps easier for those who have not developed a very fine technic of suspension laryngoscopy which is not an easy procedure.

I indicated when I started to talk about something of results, and after all when we speak of malignant tumors, unless we are laboratory scientists, we are not much interested in their etiology and histology and so on, but we are interested in the question of prognosis. As far as my experience goes, there are a decidedly limited number of cases treated by any method, including electrocoagulation, that show good results.

In other words we talk a great deal and we talk enthusiastically and we fool ourselves. There is no answer to the cancer problem as yet. Occasionally we have a case, such a one as I hoped to show here, of a squamous cell carcinoma of the soft palate. That tumor was about the size of an egg. The man's mouth was open. A large amount of morphin was necessary to keep him comfortable. Radium had been used by direct application, with screens and implantations of glass radium emanations had been made with only one result, that is stimulation.

The thing started to grow more rapidly, more vigorously after each radium treatment. In that particular case a coagulation was done. A coagulation far more extensive, more radical than I thought was justified at the time. The result in that particular patient was that the tumor gradually sloughed out and the palate was replaced by a fairly flexible, smooth white scar. Now after a period of about two and one-half years, the man is perfectly free from any sign of a foreign growth on the palate. There is no evidence of metastases elsewhere. In other words, that is possibly a cure.

Another individual, an old lady, had carcinoma of the lip, and following a coagulation more extensive than one thought quite justified at the time, after a period of almost three years now, the patient appears to be perfectly well.

In conclusion, I should say this, that while I don't like to be unduly pessimistic, I still feel that with surgery or x ray or with diathermy or combinations of them we can do very little with carcinoma.

Discussion.

Dr. C. W. Hanford: What is cancer? Someone has stated that it is the epithelial cell plus something, and when we attack cancer in the mouth, we are approaching a septic plant where everything is working against us, whether we apply surgery, electrocoagulation, or radium we have the septic element to contend with.

Most of the cancers of the oral cavity are of the squamous cell type, considerably more resistant to radium therapy than the lymphoid tissue. There are certain areas of the mouth that when attacked by cancer seem to be more amenable to treatment than others. For instance, carcinoma of the buccal cavity is very difficult to manage. Carcinoma of the floor of the mouth is very difficult to manage, while the tongue in the majority of cases seems to be quite amenable, especially as far as the initial need is concerned.

When carcinoma attacks the floor of the mouth, the glandular metasteses occupy the sublingual and submaxillary glands first, and when at the base of the tongue, the cervical glands usually are first attacked.

I should like to say a word in regard to preventive therapy. Everyone who has a cancer of the mouth has had a warning. It may be a jagged tooth or faulty

denture that has caused it. There may have been a leukoplakia existing, which, if it had been attended to properly, would have done away with any cancer formation, because we all know that cancer is due to continual irritation, and therefore, it is our business as physicians to impress upon the laity the necessity of taking care of the little sore that has occurred on the tongue or in the cheek and having it attended to before it becomes a carcinoma.

I can say this in regard to prognosis. Every case of carcinoma that has commenced to metastasize is, in my belief, a doomed case.

I recall now a man who came to me with a carcinoma of the tongue, a very small affair in which I used radium needles. The lesion quickly disappeared. At that time he had metastasis in the cervical chain. This was treated by what we term a radium pack elevated about 2 c. c. above the skin. This went down in size, and he was very happy.

Soon after that in the submaxillary gland another enlargement was noted and treated in the same way, and it went down very well, and he was happy.

About six mouths after that the physician who had attended him or had been observing him, called me up and said, "Mr. S. is dead."

I said, "What from?"

He said, "Carcinoma of the brain."

That is why I say once we find an evidence of metastasis, the patient is doomed absolutely.

Now as regards diathermy, I do believe that the electrocoagulation does in many cases do better in certain mouth cancers than radium, and especially if it is a recurrence after radium application, because then with further application of radium the effect is nil.

The easiest field to get results from the application is in epithelioma or carcinoma of the lip, and I believe in the contact application, not the introduction of seeds or needles in those cases; and neither do I believe in the use of seeds or needles in the oral cavity in the majority of cases with the exception of the tongue, that being an incorrigible member. It is necessary to use needles there, but in the cheek, in the palate, in the floor of the mouth, the contact application is vastly superior because we are producing no trauma.

In regard to metastasis of the glands, the Mayo Clinic did a block resection in some 500 cases and every one of the cases died of carcinoma, either a recurrence in the scar tissue or in some distant part of the body, and I can heartily agree with one of the essayists that in all of these cases radium and electrocoagulation are tallying, especially in the case where carcinoma has gone beyond its localized area and has infected the gland.

DR. M. H. COTTLE: I wish to make just one or two suggestions with reference to malignant neoplasm of the ear, nose and throat. In the event biopsy is necessary, as for example in the charity case I had at one of the hospitals, you may be interested in what we did. The intern called me in and said he couldn't dissect a certain tonsil in a boy of fourteen. I found a tonsil en masse which was very infiltrated in character. I felt that it might be of a malignant nature and that a biopsy was indicated. To have done the ordinary surgical biopsy was contra-indicated, therefore we used the so-called radio knife. The same can be done with a diathermy snare. Just an ordinary nasal snare insulated at the external end can be fastened around a piece of the tissue and with a diathermy current, a piece of this tissue may be removed using coagulation for the removal; or by an ordinary diathermy knife a piece of tissue may be removed for biopsy purposes.

DR. DENMAN: May I ask the essayist in closing to designate the line of demarcation as nearly as he can determine between a case which they feel sure that radium could control and the case that would be regarded as fit only for laryngectomy in order to preserve the patient's life. Is there such a distinction? If so, in what case would we depend upon radium and in what stage would we refer the case for laryngectomy?

DR. E. N. KIME: It is with some little embarrassment that I address a group of surgeons as an internist who has done surgical operation in this field, and I would like to present a case briefly and ask for your criticism and prognosis because that is the thing that interests me the most.

Six months ago I was called to the hospital to see a woman with a fungating epithelioma of the nose, advanced, ulcerating, involving the entire nose, and as we later discovered the left antrum, and reaching to the inner canthus of both eyes, also involving the forehead as far upward as the bregma

The history briefly is that of a woman sixty-two years of age who for the past three years had had a gradually increasing enlargement of a wartlike growth. It started along the side of the nose. This had been treated preliminarily by a series of fulgurations. In other words, incomplete destructive desiccations with

the result that it had gradually increased in size to the point where I was called to see her.

It was early summer. The condition was obviously inoperable. X ray therapy had been useless, and as a purely palliative measure, we considered removal of the mass in toto, realizing that we would likely have involvement of the orbit on one side and of the antrum.

This mass was removed by a technique with which I am sure you are all familiar, bipolar diathermy. I used for the active electrode a very simple device, a Bard-Parker knife, a small knife blade pointed and curved. The mass was removed without hemorrhage. The antrum of course being open, we followed down into the antrum and removed the mass so far as we could follow it. There was little shock. She had a satisfactory recovery.

After about six weeks there was sufficient cleaning of the mass so that skin graft was done. We have succeeded in lining the antral cavity. It is almost completely healed at present. The antral cavity has grown into the the nasal cavity. I might say incidentally the inner wall of the antrum and turbinate bones were involved and they were removed on the left side. The woman has been receiving systemic ultra violet radiation. She has gained nine pounds in weight and has no evidence of any local neoplastic involvement in her nose. In this case, of course, histological section was performed immediately before the removal of the nose. We simply cut it off with a knife and then went ahead and coagulated.

I present this case for your criticism and for your prognosis.

We now have a woman with a large cavity in the face. It has healed considerably. What is her likely prognosis in view of the fact that we had such an extensive growth to begin with?

I might say that an ophthalmologist tells me the eye is all right so far as he can determine.

Dr. Thomas C. Galloway: I am sorry that Dr. Novak has left this feeling of pessimism about his work. In the first place Dr. Novak has met a class of material which is very much worse than the average, hopeless cases which are sent in after everybody else has had a hand in them, after all kinds of treatments have been undertaken and after they are way beyond ordinary surgical intervention. Those cases perhaps do not get well, the cases Dr Novak has treated with diathermy, but they certainly have had a happy turnover. For six months they are relieved of the foul odor and their lot is entirely a different one than it would have been if they had simply been left alone.

One of the doctors has restated something we have all known and taken advantage of, and that is that treatment is not to be one thing or another exclusively, but that treatment is to be a combination of the various agencies we have and is to be determined to a certain extent by the histological appearance of the tumor. The tumor which approaches the special type is treated by radium, a tumor which has a highly embryonal structure. I must state that he embryonal tissue is treated with x ray and the tissue that is highly specialized is treated with diathermy.

I had an unfortunate case which was treated with diathermy incompletely, and the thing is growing like wildfire. Those tumors, I believe, are usually much benefitted by radium and are much more susceptible to radium than the highly specialized tumor.

Dr. Samuel Salinger: Dr. Denman's question should have been put the other way. Where is the point at which laryngectomy is no longer indicated and radium and other physical measures should be used, because we laryngologists realize that laryngectomy is simply the only method of treatment that offers a good chance of recovery.

As I stated in the paper, I never attempt to use radium in cases of that kind, so that when the lesion involves the vocal cord alone in which there is no limitation of movement of the arytenoids, we consider that a strictly intrinsic case and that is a case for laryngectomy. The minute there is fixation of the vocal cords, we know the lesion has invaded the joints, therefore the tissues behind the larynx are likely to be infiltrated.

There is nothing more I can add except that as we get older we get wiser and more conservative, and I am glad to see that is beginning to show itself in my friend Novak.

Dr. Frank J. Novak, Jr.: Dr. Kime's patient is really interesting, but I believe it impossible to offer an opinion as to the prognosis of that patient. There are a lot of cures after six months and not so many after twelve months, and still less after eighteen months.

Dr. Galloway strikes a little more optimistic tone than I did. I believe I was at the county hospital a little longer than he was, and perhaps some of the sad experiences that I have had account for my pessimism. It used to be a regular procedure—an operation, and then not so long afterward when I met the intern and asked, "How is the patient," he replied, "Oh, he is dead." It became so monotonous I didn't ask: I looked around and saw the vacant beds.

RATIONAL METHODS OF TONSIL TREATMENT*

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Tonsils have gained a position of much prominence in the present day discussion of medical subjects. That the tonsils are the gateway for the entrance of certain systemic and glandular infections is quite generally agreed. Healthy tonsils which are not found uncommonly in individuals of otherwise normal standard demand no attention except the usual check up in routine examinations, and measures adopted for keeping them clean when necessary.

Before undertaking any tonsil treatment, the physician should make a thorough examination of the entire mouth, nose, and throat, carefully correcting any condition causing impaired function, and employing every means at his command to bolster up all lines of defense against the invasion of microbes through the upper respiratory tract, as only in this way will the system of the patient be properly guarded against the entrance of pathogenic micro-organisms. All tonsils which are unhealthy should have some form of treatment. What that treatment shall be should depend upon what constitutes the abnormal tonsil condition, whether it be a simple hypertrophy, a malignancy, tonsil tissue having crypts filled with pus or other foreign material from which infection may be disseminated, tonsils of such structure as to make them constantly susceptible to inflammatory reaction such as tonsillitis, or any other deviation from the so-called normal tonsil.

Some advocate and advise that all tonsils should be removed. These extremists have as yet furnished us with no proof that the tonsil may not have some useful function. Until they do, we are justified in maintaining an attitude of conservatism, and treatment which can and does remove pathology from the tonsil and still leave healthy tissue capable of useful function would seem to be in every way desirable.

Tonsils, being markedly susceptible to infection, give rise thereby to the development of many diseases in remote parts of the body. These are too well known to require enumeration here. Allowing that the tonsillar structure is such that the crypts are the source of infection either local or constitutional, what then is the logical or rational procedure to be followed?

Internal and local medication is usually ineffective and temporary in action. Surgical removal is attended with risk of life and may be followed by much damage to throat structures and consequent disturbance of throat function. Deep destruction of the tonsillar tissue en masse as by electrocoagulation with the bipolar high frequency current is attended with much of the same risk. The clean up of the tonsil including the eradication of all sponge-like openings which is accomplished by the operation of electro-desiccation when properly applied seems then to be the modus operandi of choice, since it is entirely free from any element of danger, and the results following its use in many hundreds of cases covering a long period of years by the writer and other workers in this field have been all that might well be desired.

This method is always justified as it confers an immunity from tonsillar infection, and by its use the health and life of the patient are conserved rather than placed in jeopardy. The conservative or rational methods of treatment now in use are radium, x ray, ultra violet, and the high frequency electrical application known as desiccation. These several methods are all

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useful at times, and many troublesome tonsil conditions are encountered which are best relieved by a combination of these agents in their treatment. It has been undeniably demonstrated that the use of the x ray or radium will cause a shrinkage of lymphoid tissue. Consequently the employment of one of these measures is indicated in some cases of simple hypertrophied tonsils. The sterilization qualities of the ultra violet are established so that this agent may be used to overcome infection which is accessible to this form of radiation. Electrodesiccation has the combined properties of reducing and sterilizing all tissue with which it comes in contact and it may accomplish this without too much destruction.

It is a well established fact that many infective conditions have their origin in the tonsils. Many cases of cervical lymphadenitis are quickly cleared up not only by the complete ablation of the tonsils but by other measures which sterilize the tonsil and at the same time cause a closure of the tonsillar openings or crypts. Such clinical proof is convincing. It is in the tonsillar crypts that most local and systemic throat infections originate, as we often find food particles, bacteria, and tissue particles in these openings. Any method then, which will cleanse or sterilize this prolific source of trouble and by breaking them down remove these crypts as further channels of absorption should be a most potent means of protection. Such a method is available in the local use of ultra violet and desiccation.

In his treatment of tonsils by the ultra violet, it is the custom of the writer to make use of general irradiation as obtained from the air-cooled lamp, either the mercury quartz or carbon arc applied to various parts of the body for its tonic effect in addition to the quartz applicator of the water-cooled apparatus applied directly to the tonsils, using a dosage which will give a reaction not quite reaching the production of a blister. This is repeated at variable intervals of time, dependent on the reaction of the individual, usually once in three or four days, and continued until in the judgment of the operator all is accomplished that can be from this method. This treatment restores the throat tissues to a much healthier condition with no resulting damage to its structure. Singers and public speakers who have frequent demands for the use of the voice find a marked improvement in its tone and strength following this application of the ultra violet.

The use of ultra violet radiation applied to tonsils is not only destructive to the pathogenic bacteria which may be present, but also increases the resistance of the tonsil tissue to such invasion by means of an increased phagocytosis.

The surgical removal of tonsils is attended by much risk in bleeders or children having a family history of bleeders, and in adults in whom the tonsil is very hard hemorrhage is apt to occur. In those having occasion to use the voice in public speaking or singing, tonsil operation is attended with some risk of voice impairment.

The radical treatment of tonsils by all methods except that of dessiccation is attended by the risks accompanying the administration of anaesthetics either local or general. Both the operations of tonsillectomy and tonsil electrocoagulation are usually followed by some degree of edema, cases being on record in which it occurred to such an extent that tracheotomy was considered necessary to save the life of the patient. The mass of sloughing tissue resulting from electro-coagulation if allowed to remain, may be accompanied by secondary hemorrhage at the time of its separation, and if immediately removed by curettage is subject to the same danger. Following electro-coagulation, pain is sometimes so severe as to require the administration of narcotic drugs. On this account, it is the opinion of the writer as between the removal of tonsils by tonsillectomy

or by electro-coagultion, the choice is in the favor of the former, but that both methods fall far short when the question of safety in operation and in freedom from dangerous complications are concerned as compared to the method of treatment by electro-desiccation.

For convenience of application, an electrode which was devised by the writer for this work and now known as the McFee fulgurator is used. The monopolar current which is delivered from the Oudin terminal of the high frequency apparatus is employed. The spark is previously tested by bringing the electrode close to any piece of metal held in the hand, the setting of the machine fixed at a point which will produce a white spark of the desired length of one-quarter to one-half inch in this test. Crypts containing foreign substance are cleaned out before beginning treatment. The position of the patient is upright in a chair facing the light if direct light is used, or treatment may be administered by artificial light reflected by a head mirror. No mouth gag is necessary. Swab the tonsils, uvula, and pharynx with a solution containing equal parts of adrenalin 1/1000 and cocaine 10 per cent, or any equally efficient local anaesthetic. In a few minutes this may be repeated if necessary. With the mouth well open keep the tongue out of the way with a tongue depressor, preferably of wood or glass. Introduce the electrode so that its glass covering, which projects from one-quarter to one-half inch beyond its active metal point, touches the tonsil, having previously turned on the current from the high frequency apparatus. Rapidly pass the spark over the tonsil surface until reaction occurs as shown by a white film. The tonsil tissue should not be penetrated by the electrode used. In nervous patients, if gagging occurs, we may have to quickly withdraw the electrode; then go back and repeat the application. In most cases, both tonsils may be treated at one sitting. Care should be exercised not to spark the pillars or uvula as this may result in swelling and in other uncomfortable reactions. A slight irritation of the throat is felt for two or three days, but this is readily relieved and controlled by the use of any soothing gargle.

In a period varying from five to seven days, the tonsils will be found clear of the white membrane and our treatment is then repeated, continuing at these intervals until the maximum result is obtained, which usually occurs in about six weeks, depending largely upon the amount of hypertrophy present.

The observation and experience of the operator will be his best guide regarding variation in technical details. In any case where the pillars and uvula have been unavoidably sparked, resulting in much discomfort to the patient, marked relief will be given by the direct application to the tonsillar area within the throat of ultra violet from the water cooled apparatus. For this purpose good use may also be made of the non-vacuum surface high frequency application to the outside of the neck.

Various methods of technique for the treatment of tonsils by electro-desiccation have been advocated. Each of them has certain commendable features. The writer, having made use of several varieties available, has reached the conclusion that safety, effective results, freedom from dangerous or distressing complications considered, there is no method that compares favorably with that of the monopolar high frequency spark as described above. There certainly is an appreciable action of the current used in this manner on the spongy tonsil tissue other than the immediate surface burn, and this is probably due to the recoil of this soft tissue under the mechanical bombardment action of the high frequency spark. This is well shown by the decided shrinkage of the tissues which occurs during each interval between treatments.

Should there be any recurrence of troublesome tissue due to incomplete treatment, it is a very simple matter at any time to destroy

it in a similar manner. It is also true that the follicular tissue in the immediate vicinity of the tonsil which is often an added source of infection is destroyed when our desiccation is thorough, and this follicular tissue often remains after the ordinary surgical removal of the tonsil. The vast improvement in the general health and the stopping of local infection and recurrent inflammatory conditions are the best clinical evidence of the effectiveness of this deisccation treatment.

In any case of malignant tonsil tissue, the preference then would be for its removal by electro-coagulation since there would be much less likelihood of metstasis providing this had not already begun; and it is quite generally agreed that the removal of all malignant tissue should be accomplished at one sitting.

In the treatment of over two thousand tonsil cases during the past eighteen years by the method of electro-desiccation, the writer has seen no unfavorable results. In practically all of the patients treated the general health has much improved; recurrent inflammation and other conditions such as tonsillar abscess have been eliminated; there has been no new growth of tissue in the tonsil fossae; glandular swellings known as cervical adenitis have many times disappeared; and conditions of infection resulting from tonsil disease such as arthritis and neuritis have completely cleared up in many of those patients treated by this method.

Whenever tonsil tissue is suspected of being the cause of impaired health it should be considered pathologically abnormal and some rational method adopted for its treatment.

THE TREATMENT OF NERVE PALSIES*

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In general, we may classify paralyses as central and peripheral. The former are directly due to brain disease or injury, the latter to traumatism, pressure, or inflammatory conditions affecting the nerve after its emergence from the spinal cord. Paralyses are exceedingly varied in causes, symptoms and effects, and in the locality and distribution of the nerves concerned.

It is obvious that so inclusive a subject cannot be discussed in a brief paper; we shall therefore confine ourselves to a consideration of only a few of the more common palsies, especially those of a peripheral type, which are due to any traumatism or inflammatory process with a resulting partial or complete paralysis.

An injury may effect a nerve either in its whole extent or in one of its terminal branches. Thus we have a variety of symptoms and a diverse therapy may be indicated. Injury in the continuity of a nerve may be due to penetrating wounds, pressure, blows, severe traction, or as a result of surgical operations. The nerve may be divided partially or completely.

The World War gave abundant opportunity to study intensively these peripheral nerve injury cases, a mass of statistics having been presented by French and English authors, especially. In many of these reports, there seems a preponderance of injuries of the upper extremities, no doubt due to the method of trench warfare in which the upper body was more exposed. For example, Tinel summarizes the statistics of incidence of nerve injuries in French soldiers. In a report of 639 cases, it was found that 408 affected the upper extremeties, distributed as follows: musculo-spiral (radial) 146; ulnar, 84; median,67; musculo-cutaneous, 11; circumflex, 25; brachial plexus, 27; combined lesions, 48.

The interruption syndrome, when complete, causes a loss of all of the functions, sensory and motor; paralysis in the involved muscles is complete, tonus is lost, limbs assume attitudes caused by the pull of the antagonistic muscles; as a rule, there is no pain, but muscle anesthesia. Also, there is an absence of the usual reflexes, and there is modified electric reaction.

In incomplete division, the sensory symptoms may be practically normal; but Sherren maintains that contrary to the usual teaching, the motor loss in incomplete division is not more than the sensory loss. Paralysis of the muscles supplied by the injured nerve may result after eight to fourteen days. The usual reaction on or about the tenth day is that the muscles do not respond to the Faradic current, but do react to the Galvanic. Pain is a frequent sequela of incomplete division, also tender and glossy skin, deformities and changes in the nails. Following complete division, after suture, there is some restoration of sensibility in from six to sixteen weeks, and may be completed in from four to twelve months. Motor recovery is gradual, electric reactions slowly returning, as in incomplete division. No regeneration takes place in the peripheral nerve without union with the central nervous system.

The muscle nearest the seat of injury first regains voluntary power, and response to the faradic current. Motor and sensory recovery vary with the severity of the injury, and the distance from the periphery. In recovery, the sensory symptoms gradually begin to appear, sometimes with stabbing, darting pains along the

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course of the injured nerve. There is pain on pressure on the nerve trunks, and a slow return and growth of muscular tissue and tonus, with a return and growth of muscular tissues and tonus.

In ulnar paralysis, there is the well known numbness of the little finger, and one-half of the next. After complete division of this nerve at the wrist, if no tendons have been divided at the same time, the patient is able to appreciate tactile stimuli. A touch with anything that exerts considerable pressure on the skin may be appreciated, and correctly localized. When pricked by a pin, the patient knows he has been touched, and may be able to locate the pressure, but fails to perceive the sharpness of the stimulus; he has lost the "deep sensibility". But if tendons are divided at the same time, as pointed out by Jelliffe, or if the injury involves the division of the nerve above the point at which its muscular branches are given off, it is impossible to appreciate even deep and forcible pressure.

Ulnar paralysis is frequent in warfare and in industrial accidents. The injury may occur by dislocation and fracture of the humerus at the elbow joint; the nerve is also frequently wounded at the wrist. If the injury is above the elbow, flexion of the hand becomes difficult. The little finger cannot be moved, and the middle and ring fingers cannot be flexed in the distal joints. Injuries lower down in the forearm cause only a loss of power of the interossei and muscles of the thumb, with atrophy.

The radial, or musculo-spiral, is pre-eminently the nerve of extension, and is frequently involved in traumatic conditions. The muscles supplied by this nerve extend the forearm on the arm, the hand upon the forearm, and the fingers upon the hand. In injury, there is the characteristic "wrist drop," and if traumatism or pressure occurs in the axilla, there is partial paralysis of the triceps. Here we have the so-called "crutch paralysis."

Bell's palsy, a fairly common affection, is the so-called rheumatic involvement of the nerve, which supplies a number of the facial muscles. It emerges from the skull at the stylo-mastoid foramen. Causes of paralysis of this nerve are varied. Traumatism may play a part, as in forceps pressure in childbirth, by operations on the mastoid anthrum, etc. The nerve may be involved in malignant growths in the parotid gland, or by operations in this locality. Exposure to cold, and consequent inflammatory conditions are common causes of Bell's palsy; in fact, the nerve is susceptible to the various causes tending to produce neuritis in general; a weakened resistance of the nerve after sudden, or long continued exposure to cold paves the way for the action of some toxic or infectious agent. It has been suggested that the large size of the nerve and the rather small opening in the stylo-mastoid foramen makes any swelling of the nerve a ready cause of pressure.

Bell's palsy is easily recognized. The face on the affected side is immobile, the lower lid droops, and the eye is more widely open, and cannot be completely closed. The patient cannot show his teeth, and when he laughs, the mouth is drawn strongly over to the unaffected side.

The prognosis, as in the case of other nerve disorders, is largely based upon electric reactions. If reaction is normal or nearly so, the prognosis of fairly early recovery is good. If the reaction of degeneration is partial only, recovery may be expected within perhaps three months; the complete reaction of degeneration gives a doubtful prognosis; however, recovery may take place in a period of six months, a year, or even longer.

The treatment of Bell's palsy by physiotherapeutic measures alone seems productive of good results. It is often necessary first of all to allay the fears of the patient that he has a dangerous disorder, and to encourage him to

go about his regular business, observing, of course, the best rules of hygiene, hours of sleep, etc. Possible foci of infection should be looked for and removed, if possible.

I am going to emphasize the fact that in the treatment I mentioned to you this afternoon, it seems quite radically different from the statements used by older physicians. In many of the books it states: "In case of Bell's palsy, do nothing but pursue an expectant form of treatment and absolute rest." This is quite contrary to the method of treatment I am going to describe.

Heat to the affected side of the face seems clearly indicated. This treatment should be begun at once. Hot water bags to the face, especially at night, should be used. The forms of radiant light and heat are very useful. The infra red radiations from the "Zoalite" seem remarkably effective, and not so unpleasant as the more glaring rays from other forms of radiation.

It has been my experience up in Wisconsin in the University hospital that Zoalite is remarkably effective. Whether that is due to deep penetration of the infra red rays, I do not know. The manufacturers claim this. There may be truth in it. We do know, I think, that the penetration of the infra red rays is perhaps a great deal deeper than that obtained from the radiant source.

In addition, diathermy should be used. The writer has had success in using the Fischer hand electrodes, which are held in place on the face by the patient himself. This may be comfortably done when the patient is seated at a table, resting his elbows, and holding one of the electrodes behind the ear, (at the exit of the nerve,) and the other high on the cheek of the opposite side of the face. 500 milliamperes may be given for a period of about 20 minutes. It is well to shift the electrode which has been placed behind the ear to the parotid region of the affected side, for a portion of the treatment. Mild galvanic stimulation of the affected muscles is well applied, after the heating process mentioned above. Massage of the muscles is helpful, and an attempt at moderate exercise should be practiced. A good form of exercise is to have the patient try to inflate the cheeks, making an effort to prevent the escape of air from the affected side of the mouth. Recovery takes place gradually; usually the affected eye is last to regain the power of closing naturally. One of the first signs of improvement is the extension of the wrinkles on the forehead, when the patient raises his eyebrows by muscular effort. If during sleep the eye is imperfectly closed, it is often well to apply a small strip of adhesive plaster extending from the cheek to the forehead, pulling the eylids together, thus preventing an undue sagging and stretching of the partially paralyzed muscles. The forms of treatment mentioned above are best given daily, or at least three times a week.

Although not a peripheral palsy, it would seem necessary to mention the physiotherapeutic treatment of anterior poliomyelitis, a disease which has been recognized since the 14th century. It has been known as an acute infectious disease, however, only since about 1880. It is necessary only to say a word about the usual treatment in the acute stage. Isolation comes first; then rest in bed, sometimes counter-irritation to the spine, by means of mustard, or high frequency sparks, diaphoresis by means of hot packs, and warm baths of from 102-104 degrees. These seem to relieve muscular pains and soreness, which are often present. It is only in the chronic stage that physiotherapy is advisable. After the acute stage, there is the well known hard stage, lasting for weeks, months, or years, of partial or total paralysis, weakness, tenderness, nervous irritability, and muscular pain, with gradually increasing deformities. The diet, of course, should be full and regularly administered. A careful inventory should be made of every muscle group, both in terms of func-

tional capacity and electrical excitability, carefully noting milliamperage necessary for bringing about contraction. A series of muscular girth measurements should be taken, for the purpose of determining from time to time any change denoting atrophy, or otherwise. Support, in the way of braces, etc., should be given to avoid pain, stretching, and to diminish the tendency toward contraction.

Massage, intelligently given is of great value. In its various forms, it is stimulative, it increases circulation, produces warmth, and has a beneficial effect upon the skin and underlying tissues. It hastens especially the venous and lymphatic circulation. However, it may easily be overdone. Long continued or violent methods of massage should never be used. It has been found by various authorities that massage for five minutes on any one muscular group produces a maximum beneficial effect. Continued longer, it may weaken muscular tissue especially the atrophied musculature found in the various forms of paralyses.

However, it may easily be overdone. I have seen cases of infantile paralysis sent to masseurs who have in my opinion very seriously injured the case by means of excessive and massive doses of massage. It has been pretty well proven in regard to massage that massage given to any particular muscle group is of advantage most largely when given for a period of five minutes and not any more. I mean to say that if you are working for the physiological effect of message on any one group, as a biceps for instance, a massage for five minutes is vastly better than a massage of half an hour, and as a matter of fact you get precisely the same physiological results, and a longer period of massage brings about destructive changes I think which are undesirable.

That is one thing we want to bear in mind. Of course, if we give a general massage, we have to spend a long time at it, but don't give massage in any one locality for a period longer than five minutes.

Some interesting experiments have been performed along this line. It has been found that after a period of massage an isolated muscle could regain 100 per cent of its strength after five minutes massage. That is the isolation of one muscle or one finger used with the ergograph. That muscle can be restored 100 per cent to its normal activity in five minutes by massage, and if rest only is given, it will restore it to only seventy per cent of its normal activity. So you see that it is clear that massage brings about muscular regeneration and the removal of fatigue probably more quickly than rest alone does. I regard that as rather important formula.

Massage is in reality passive exercise. By its means the nutrition of muscle is aided and muscular growth is stimulated. This is an important result to be sought for. It is very important to keep the muscle tissue in the best possible condition and of maximum nutrition, so that when the nerve begins to recover, it may meet muscles that are not excessively atrophied. Cases of extreme fibrous degeneration of muscles were often seen in our experience with peripheral nerve injuries during the war. These cases had had no physiotherapy treatment overseas, and for long periods were neglected before they could be returned to this country.

In the army I saw most distressing cases of paralysis in which massage was not used. I happened to be in charge of the physical therapy work in 1918 and 1919. We got these men as they came from overseas. Nearly all of them had peripheral nerve paralysis. Some of these boys on shipboard and in confinement in hospitals overseas had had no treatment whatever. As a result the muscles began to waste and we saw many cases of fibrous degeneration. The muscle tissue had actually changed into fibrous tissue, which no method could restore. It had gone

beyond the power of massage. Massage is a passive exercise. We can supply the exercise by means of massage. I believe it is the most valuable physical agent in the treatment of certain forms of paralysis.

Active exercise should be encouraged in the chronic cases of poliomyelitis and other forms of paralysis, each affected muscle group given appropriate voluntary movement throughout its range of possible contraction. Here again, we must use great care not to overdo, and excessively fatigue the weakened muscles. The exercises should be progressive in frequency and force, and should be done short of fatigue. If the power of muscle is not sufficient to move the limb against gravity, assistive exercises should be used. That is to say the patient should be encouraged to make as much movement as possible and then the operator should assist that movement in raising or flexing a limb as the case may be and so to assist the muscle in its physiological contraction, or the limb put in such position that the weakened muscle may be able to contract and thus produce movement which would not be possible otherwise. That is to say, we can remove the force of gravity as far as possible. The "sling suspension" method is very valuable. Dr. F. J. Gaenslen, of Milwaukee has done much to devise such a method, and says, that "the method consists in suspending the extemities to be exercised in a sling in midair to eliminate entirely both gravity and friction as hindrances to the to-and-fro motion. It is generally conceded that voluntary motion, involving as is does physiological exercise of the entire neuromuscular mechanism, is of vital importance in the restoration of muscular power. Any method, therefore, that facilitates this function, should be of value. In the method of sling suspension, very slight muscle power can be translated into actual movement. Moreover, very slight gains in power are measured by appreciable increase in the arc of motion. The mental stimulus to both patient and parent, or teacher, is a factor of importance in enlisting their best efforts in systematic and persevering application to the long and tedious task. The method is best adapted to those cases having the merest trace of demonstrable power, or at any rate, insufficient power to raise the limb against the force of gravity, or to move it against the friction of the examining table. When the weakness is less pronounced, graduated resistance may be offered, and comparative tests by the spring balance method devised by Lovett can be readily carried out."

The use of galvanism and faradism in poliomyelitis is not desirable. We must remember that the disease is one of the spinal cord, or central, and not of peripheral origin. It is easy to overdo electric stimulation, and thus put the weakened muscles in a worse condition than before. The most valuable form of exercise is that of a voluntary nature, and not mechanical contraction of the muscles by electricity. The physical stimulus to muscle comes from the cerebral cortex; hence voluntary exercises are the best form of training. Diathermy may be of value because of its warming effects and the increased circulation caused thereby, thus insuring the nourishment of the muscle.

I am free to confess I have not done much in diathermy in anterior poliomyelitis cases. I believe we have a very powerful modality in diathermy.

In conversation with Nagleschmidt yesterday when he recommended diathermy to the spine in anterior poliomyelitis, I asked him his technique. He said he applied to the front of the body an electrode, say the upper part of the chest, and then he applied diathermy perhaps by a condenser electrode or non-vacuum electrode slowly going up and down the spine as far as that front electrode extended, very slowly going up and down the spine until the patient felt the sensation of warmth.

In this method he could be quite assured that the spinal cord was getting diathermic cur-

rent. After treating the upper spine, the electrode was placed lower and then the next section of the spine treated in that way. That could be done, of course, by means of stationary electrode as well as this other method, but I am giving you that suggestion.

Exercises with the body partially, or almost completely immersed in water are often of very great value, as in the "tank" method of treatment, which allows the patient to walk and balance in a small tank of water; thus much less muscular effort is used on account of the buoying power of the water, a portion of the body weight being taken from the weakened muscles. This assistance helps the patient also to gain confidence and to re-establish his muscle sense.

When the patient has the ability to move the leg, we place him in the tank and he gets a muscular action, and beyond all, the muscle sense of locomotion which perhaps he has lost. So I think the training of the muscle sense is an important thing in all forms of paralysis in which the muscles have long been inactive.

To sum up the forms of physiotherapy treatment of palsies, we may repeat and emphasize these methods: Massage, to maintain tone and to increase circulation; heat, in its various forms; voluntary corrective exercises, (passive, active and assistive) which are progressive and carefully supervised; the careful use of galvanism and faradism in peripheral nerve palsies, (preferably the slow sine wave) discarding their use in central paralyses; proper hygiene, including abundant diet, sleep, fresh air, sunshine, or its substitute, the ultra violet rays; and above all, patience and persistance in the treatment of these disorders which are often of such long and weary duration.

Discussion.

Dr. Frank J. Novak, Jr.: It is very interesting to see how much information can be packed into a relatively short paper. I do not feel qualified in any respect to talk about the palsies of the extremities, but I feel we are all interested in the seventh nerve.

Dr. Elsom mentioned the anatomic fact that the stylo-mastoid foramen is not much larger than the nerve that passes through it, and naturally it is very easy to understand how a slight swelling in that region would cause an impression of the nerve and paralysis of the seventh nerve and we Americans who do not operate quite so radically do not get paralysis of the seventh nerve.

A doctor several years ago made a statement that an otologist who operates on a mastoid and gets a paralysis of the patient's nerve shows that he does not know the anatomy of the temporal bone. That statement, of course, was not allowed to go unchallenged.

In a museum in the East, there is a specimen of the temporal bone. It has been assumed that the facial nerve is rarely if ever in an anomalous position. This specimen shows that whereas the nerve should lie in this position in reference to the mastoid antrum, the middle ear and the aditus of the antrum, the facial canal lay within the cellular portion of the mastoid and passed up through the aditus at a level at which it is not supposed to reach. From externally inward the facial nerve at this point is median to the horizontal semicircular canal. In that specimen it is lateral. In other words, operation on that mastoid using the normal technique which everybody employs, would not fail to result in the facial paralysis, and that specimen is a very valuable thing. It is an important thing to have in these matters. If it can have an anomaly in one bone, it is reasonable to expect it will occur in other bones.

Paralysis of the facial nerve from trauma during operation is a possibility, but we find that the facial nerve is paralyzed not only by trauma but as a result of the inflammatory changes which occur in acute mastoiditis.

Paralysis of the nerve in the case of acute mastoid infection is an imperative indication of immediate operation.

We know that higher up another branch is given off to supply the stapezius muscle and it isn't hard to understand how infected material can travel from the various nerve spaces and involve the nerve itself. The canal is not only small and the nerve fills the canal at the opening of the stylo-mastoid foramen, but the can-

al through its entire course is the same and it is possible at any point in its course through the temporal bone that the facial nerve may be involved and not only in its course through the canal but its emergence from the internal meatus. We know the facial nerve comes up from the interior and the nerve fits in pretty tight into that opening, and then of course comes out and enters the brain stem, but a lesion such as a tumor which is not at all uncommon of the acusticus meatus originating either in the auricular portion of the eighth nerve or stemular portion of the eighth nerve, and those tumors do originate within the entire auditorius meatus and produce paralysis of the seventh nerve; so aside from infection in the mastoid and aside from cold and exposure where the nerve comes out into the neck, we must remember that such a thing as acusticus tumor will cause paralysis.

Sometimes it is a question of diagnosis to arrive at a conclusion as to where and why the facial paralysis occurs. There are a great many things that might be said about this thing, but I think they will be brought out by other men who discuss the paper.

Dr. Joseph E. G. Waddington: The keynote of Dr. Elsom's paper is intelligence in making the diagnosis. If you have peripheral paralysis, it is no good to apply any physical therapy measure whatsoever if the nerve is impinged in bony tissue. That is the keynote to the treatment of paralysis, peripheral or otherwise.

Before I get into the discussion of this paper, I wish to mention the treatment of poliomyelitis. Here is another way to think of, the different way of applying diathermy to the spine to get the heat in the greatest intensity to the spinal cord. If you will get the autocondensation pad, lay the patient upon that with the back up, and then take your electrode of tinfoil or thicker foil, if you want an inch wide, and get it over the part affected, you can get all the diathermy you want, all the heat you want through that part and localize it very well.

There is no difficulty applying it and you know you are going to get it. There are other methods, of course. I want to emphasize this point, that when you are testing the reaction of degeneration of nerve tissue, don't keep on trying to get a reaction after you localize your modal point sufficiently and know it is somewhere in that region don't keep on indefinitely testing out. If you do get a flicker, stop. That is sufficient.

Dr. Elsom also brought out when you are applying exercise to a weakened muscle, which of course you get in peripheral paralysis, do not keep on indefinitely with exercise. Certainly do not go above ten minutes. When you start in, the nerve is convalescing. Start in with just a few seconds and gradually increase.

Another thing, in treating polioymelitis I see cases sent to me with instructions to put on current directly to the muscles. You have got to get at the lesion, especially acute conditions. You must get at the lesion itself, treat that. Don't forget the lesion in your anxiety to get at the atrophy and then also look after the seat of the condition.

You will see hundreds of patients of bone tuberculosis cases. As long as they have fever, they are not allowed to walk maybe for several weeks and several months, and yet you see scarcely any atrophy of the muscle because a muscle does not atrophy from disuse alone; it atrophies from lack of light and air, and these cases exposed to the light and air do not show cases of atrophy.

Another thing I wish to bring up. If you are using diathermy or the radiant light or heat, usually follow with some kind of contractile current, because after you have brought on hyperemia to the damaged part, it is like taking a hot bath and taking no exercise, whereas if you get friction after a hot bath, you get reaction, and so with diathermy or heat lamp. Do not stop. Simply go ahead with contraction current so as to drive out excessive hyperemia. Otherwise you find patients complain after treatment with diathermy. You can minimize the pain if you will use contractile exercise afterwards.

Dr. Edwin N. Kime: First, we cannot expect to get results in nerve palsies unless we know the nerve is intact. If it has been severed, nothing but nerve suture will be of any avail. If under pressure of callus or that sort of thing, that must be removed.

Secondly, the earlier we get these cases, the better will be the results. I have been fortunate enough to observe the application of physical therapy to a case of poliomyelitis in which treatment was started in the sixth week. Just as soon as the child could be moved to the office, the treatment was instituted. It consisted of diathermy to the spine and of radiant light and heat and hydrotherapy to the extremities followed by sinusoidal current. I have moving pictures to show the result of this case. I am sorry I didn't bring them along, but the child began to move the limbs at the tenth week and has been walking since the third month. He was completely paralyzed from the waist down when we

started treatment. Serum was unavailable in that particular instance.

Another case in point, that of a young man who while doing some unaccustomed chores about the farm was unfortunate enough to be hooked over the external epicondyle of the humerus. The force of the blow localized over the musculospiral nerve. He immediately developed wrist drop and was treated for three weeks by the cock-up splint, which is all right as far as it goes, but nothing else.

He was referred to me by a neurologist to determine whether surgery would be necessary. We decided to go ahead with physical therapy. I might say that in this case there was very early reaction degeneration. After daily treatments following the technique Dr. Elsom has outlined, this man made a complete recovery and went back to his occupation of bank clerk handling bills, stating that he had complete recovery but that at the end of the day his extensor muscles would feel a little tired.

This gives us an example of how we can apply our agencies scientifically, but I want to emphasize in addition to what has already been pointed out, insist upon as early application as you possibly can.

Dr. Linn: May I just add that in the ear work where the sinusoidal current is used, it seems to me it should never be applied more than two minutes. Two minutes is the longest ever used in my practice, and it seems to be injudicial to apply it for a longer time

Dr. Elsom: We do not have any definite length of time for the application of galvanism at all. In very many cases I use galvanism ten seconds instead of two minutes because if you get a half dozen contractions that is enough. and so you have to be guided, of course, by the gradually returning strength of the nerve and try to get a physiological load to carry and you know that muscles of course vary as to their capacity for carrying physological loads. Muscles in all of us differ very materially in that respect. What would be easy work for one man would be tremendously hard for another. Don't forget that we are treating this particular muscle and that it may be very weak indeed.

I want to say again perhaps that in giving these forms of treatment which I have mentioned, I think the first thing to do always is heat. Massage is very much better applied after heat has been administered. Electricity is very much better after some form of heat has been applied, and so instead of reversing this method that I have seen some physical therapeutists do, give galvanism first or what not, use your heat first by all means and then follow with the current.

Torticollis or what we call static contraction usually due to a shortening of the muscle, can only be relieved by a surgical operation. However, I think in all of these cases of torticollis much may be done by a gradual, forcible stretching of the muscle itself. If the head is bent to the right, by a forcible manipulation we can exert contraction on the sternocleidomastoid muscle and I think we can bring about beneficial results. But let me say in this regard, steady pressure is very much more desirable than sudden jerks. That is true, isn't it, in ankylosed conditions generally. If we want to increase the movement of an ankylosed elbow, it is much better to give steady and constant pressure, beginning very gradually and increasing, and to maintain that pressure for a few minutes and then relax, than it is to give sudden jerks because we get physiological effects better from the gradual pressure.

THE TREATMENT OF TUBERCULOSIS BY PHYSICAL AGENTS*

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The treatment of tuberculosis by physical agents, mainly fresh air and sunshine, seems to date from earliest time, but the scientific application of these physio-therapeutic methods has developed since the establishment of the Rollier Clinic at Leysen, Switzerland, some years ago. This great institution has given to the medical profession and the world at large a vast amount of scientific information regarding the physical elements concerned in the treatment of extra-pulmonary tuberculosis.

While Rollier has confined himself largely to the treatment of surgical tuberculosis by heliotherapy, still he has made observations as to the effect of sunshine upon the pulmonary form of this disease; thereby paving the way for its successful treatment by artificial agents wherein certain sources of error could be eliminated.

Etiology

The infective agent in tuberculosis, whether cutaneous, osseous, peritoneal, or pulmonary in type, is the tubercle bacillus, first described by Koch in 1882. There are two common strains of this micro-organism, the human and the bovine, which differ somewhat in morphology and perhaps virulence. Some bacteriologists claim that the bovine type predominates in milk-drinking individuals such as children, while the human strain is more prevalent in the adult. It is also possible that the one type metamorphoses into the other, but this question is of minor consideration.

As to their mode of entry into the human system, from a therapeutic standpoint, it does not matter, greatly, whether this is by way of the lymphatics of the upper respiratory passages, or through the intestines and the mesenteric lymph-stream, as has been claimed by Ravenel. Dr. Ravenel carried out a series of experiments on dogs wherein he fed the animals butter-fats impregnated with tubercle bacilli, and, according to his reports, recovered the living organisms from the lymphatics of the splanchnic area. This work, however, has not been substantiated by other investigators.

In this connection I wish to call attention to the work of Opie, wherein he proved that 100 per cent of necropsies showed tuberculous lesions in the lungs, so that all of us at one time or another during our lives, harbor active tuberculous infections in our lungs, and it is only on account of a certain degree of immunity, either active or acquired, that any of us survive.

Statistics taken in Europe and also in America have demonstrated that one out of every five persons that we meet in our daily walks through life have tuberculosis in the active stage, also that from sixty to sixty-five per cent of all school children give active tuberculin reactions at the age of fourteen years. So that the problem which confronts us today is not one of isolation or segregation, as in most infectious or contagious diseases, but one wherein it is necessary to build up the defenses of the body against invasion and to destroy the causative agent; namely, the tubercle bacillus of Koch.

Bacteriology

The bacillus of tuberculosis is a parasitic, aerobic nonmotile bacillus, and grows only at a temperature of about that of the blood-stream. Because of its waxy capsule, it is quite resistant

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to the action of heat and chemicals, but in moisture, is killed by 140 degrees Fahrenheit (in vitro) in 20 minutes. It is attenuated in virulence and inhibited from reproduction and growth by temperatures much lower. It also has the power to wall itself off within the tissues of the body, so that it is firmly fortified against the action of chemicals, serums, or other bactericidal elements in the blood-stream and its treatment by medicines whether given orally or intravenously is futile. Taking these last factors into consideration, one can readily see that any treatment, to be effective, must have power to penetrate tuberculous tissue in sufficient concentration to destroy the tubercle bacilli, promote absorption of devitalized tissue and waste products, encourage fibrosis and repair, and, at the same time support, instead of impair, the natural strength and resisting power of the body as a whole This, of course, could not be accomplished by any one source of therapy at our command, but by a happy combination of dietetic, medicinal, hygenic, surgical, and physiotherapeutic factors, we are now able to accomplish this apparently impossible task with scientific accuracy and a high degree of success.

In my discussion today, I will not attempt to elaborate on the effects of the different factors which we employ in the treatment of pulmonary tuberculosis. Owing to the wide publicity now being given to physiotherapeutic methods, most of these things are well understood by the average physician.

During the past few years we have treated several hundred cases of tuberculosis, both pumonary and extra-pulmonary, using mainly physical methods and the results that we have obtained have been so satisfactory that I do not hesitate to present our methods for the consideration of other physicians.

As a result of much experimentation, we have developed a schedule for treatment which has become universally known as the Chapman T. B. Scale.

We will say that we have a hundred per cent tuberculosis. By this I do not mean a patient that is moribund, but one that has all of the characteristic symptoms of a typical case of pulmonary tuberculosis; that is cough, expectoration, tubercle bacilli in the sputum, anemia, cachexia, loss of appetite, afternoon temperature, night sweats, positive x ray findings, etc., against this we have to offer in the way of treatment, factors such as the following:

Treatment	Per Cent
Diet	15
Rest	25
Medicines	10
Serum	5
Ventilation	10
Sunshine	5
Surgery	5
Natural Resistance	25
	100

This covers the treatment of pulmonary tuberculosis as it is practiced by most general physicians, specialists, and in sanatoria for tuberculosis today. By these methods it is possible to arrest the disease and hold it quiescent until, through the weakening influence of advancing years, intercurrent disease, or other factors, the balance is thrown against the patient. But now, through recent advances in the science of physiotherapy, we may add to the above scale:

Actino-therapy, with a value of at least 25 per cent, the x ray, and diathermy, with a therepeutic value, which, using the most conservative estimate would at least total another twenty-five per cent, making a grand total of 150 per cent.

This scale is self-explanatory and gives the treatment of tuberculosis as we employ it in our practice at the present time. Previous to the advent of physiotherapy, the most that we hoped to secure in the treatment of tuberculosis, whether pulmonary or extra-pulmonary,

was an arrested case, and complete recovery from the disease was not expected. Now, however, through physiotherapy we have additional valuable assets to our armamentarium for carrying on the war against this dreaded disease.

I will discuss briefly the more important of the factors that we employ in treatment.

For instance:—Diet. We select, of course, foods that are nourishing and easily digested, being careful to avoid and caution the patient against pickles, olives, and other relishes or condiments that are indigestible and that tend to irritate an over-sensitive intestinal mucosa. It is also thought that calcium has some beneficial effects in tuberculosis. Mayer and Wells in working with guinea pigs found that tuberculous tissue contained an excess of calcium even though no calcification had taken place. They also observed that normal lung tissue contained the least and the lymph glands the most calcium of any of the normal body tissues. This last observation is significant as we all know that the lymph glands act as barriers to the introduction of infection into the body. Phosphorus is also of value in undernourished and depleted conditions and, I endeavor, in-so-far as it is possible to supply these elements through the medium of food, adding as a routine measure a preparation of Cod-Liver oil, and a tablet that contains iron and arsenic. This tablet is put up by Sharpe and Dohme and is known to the trade as Blaud's Mass and Aloin Compound. The small content of Aloin usually suffices to keep the bowels regular. Many physicians advocate the use of creosote, but I have recently abandoned its use except in selected cases as it always tends to upset the stomach and does more harm than good. All other medical treatment is entirely symptomatic.

The value of rest is so well understood that it is not worth while discussing it here. It is of perhaps greater importance than any other single factor in treating pulmonary tuberculosis. Under this head I include the production of an artificial pneumo-thorax when required to limit the excursion and place the diseased lung at rest.

Regarding ventilation, these patients should be housed in well ventilated quarters. Their unnecessary exposure to cold air and drafts is not indicated and is to be condemned. Patients who expose themselves too freely by sleeping out in the open at night or that live in tents on damp river banks, etc., usually succumb rapidly to the disease. There is a popular idea among the laity that exposure builds up the resisting powers of the body, this is only relatively true and many unfortunates lose their lives through attempting to lead too vigorous an out-door life.

The serum, I seldom use, and while it has its application, I have little to say in its favor. Actinotherapy, using the mercury quartz lamp, I employ religiously, using in addition the deep therapy lamp when indicated. It is not always advisable to use the radiant heat lamp in pulmonary tuberculosis as the high percentage of infra-red rays almost invariable causes a congestion of the internal viscera which tends to promote rather than to inhibit the progress of the disease. This is why pulmonary tuberculosis has never been treated successfully by heliotherapy.

In addition to the ultra violet lamp, I use the x ray. This physical agent has the power to dissolve fibrous tissue. Its effect on fibroids of the uterus is well understood, and it will produce the same effects on fibrous tissue in the lungs. By using this powerful agent with discretion, it is possible to batter down the walled-off fortifications of the tubercle bacillus and bring it out into the open where it is destroyed by the phagocytes and bactericidal elements of the blood-stream. It is not thought that the x ray has any bactericidal effect in vivo, although it will destroy bacteria in the test-tube.

However, we use it only as the artillery which which levels the fortifications and precedes the advance of the infantry or cleaning-up squad as we may term the phagocytes of the blood.

As a routine measure we give one treatment with the x ray at the beginning of each week and on the following days, alternate actino-therapy and diathermy; being guided, of course, by the reaction of the patient. Occasionally I find a patient that does not tolerate some physical agent at all, and its use must be abandoned. These patients are usually highly neurotic and there is a psychological element present. One woman for instance was thrown into a severe vertigo through using diathermy on a tuberculous spine, while another would vomit for days after the slightest exposure to the x ray. Actino-therapy however, seems to be tolerated quite well by all patients altho there is a wide variation in their skin tolerances.

The radiant heat lamp quite frequently produces effects that are comparable to a mild or even severe heat prostration, and must be used with caution. It is usually contra-indicated in the treatment of febrile cases and on extremely hot days.

Diathermy

Next to x ray, I consider diathermy our most valuable physical agent. Most physicians are quite timid about using diathermy in pulmonary tuberculosis as there is a popular opinion that it causes hemorrhage. I use diathermy with impunity in these conditions and have never detected any increased tendency to hemorrhage.

It is not possible to raise the temperature of the tissues to a point where tubercle bacilli are killed immediately but it is possible to elevate the temperature of the tissues to a point where the bacilli are attenuated in virulence and inhibited from reproduction. Furthermore, diathermy, or internal heat as it should be called, has other properties that are of equal or greater value in an indirect way. As the temperature of the internal tissues is raised, there is a vasodilation of the arterioles and venules with a great influx of fresh blood to the part. There is a concentration of opsonins, agglutinins, aggressins, and other bactericidal properties of the blood with an attenuation of the bacteria and a raising of the opsonic index. There is also a marked inflow of phagocytes to the part attracted by the vascular disturbance and chemotaxis. Phagocytic activity is increased and the infection stamped out. In addition to this, the heat and the healthy hyperemia favor repair. Fibro-blasts are stimulated, the calcium content of the tissues is raised and healing proceeds.

Conclusion

In conclusion, I will say that tuberculosis is a systemic and not a focal disease, for which, at the present time, there is no specific treatment; but by the proper use of diet, rest, medicines, and general hygienic measures as practiced in the past, and by the addition of certain physical agents such as actinotherapy, the x ray, and diathermy, we are now able to treat successfully cases that formerly were hopeless, and, with a better understanding of these physical agents and their general employment by scientific men, tuberculosis will cease to be included with the list of so-called incurable diseases, and the lives of thousands that are yearly sacrificed to the great "White Plague" will be spared.

Discussion

Dr. Clement: We talk about the treatment of tuberculosis without saying anything about the part involved or whether it is a pulmonary tuberculosis. I wonder if I might inquire from the essayist whether he treated a miliary tuberculosis the same way he treated a fibrous tuberculosis without cavitation.

Dr. E. L. Cavenell (Champaign, Ill): The speaker reported the findings of Mayer and others with regard to the very small percentage of calcium present

in the lung and the large percentage of calcium present in the lymph glands and said that the findings were significant. I would like to have an interpretation of how he connects this finding with this disease.

DR. PATTERSON (Cleveland, Ohio): I would like to ask about diet, as to whether you recommend the three square meals a day or feeding midway between meals.

DR. H. A. KREUSER (Chicago, Ill.): I would like to ask the Doctor how he limits the amount and the degree of diathermy in the treatment of these cases.

DR. PLEHN (Scotts Bluff): This has been a very interesting and stimulating paper. I am sure that as far as many of us are concerned, the Doctor has mentioned one or two means of combating this condition that are comparatively new and untried. I am sure that it will be of interest if we may have a little bit as to the indications and technic in his use of x ray and diathermy, first as to quantity, voltage and distance in the use of x ray and next as to the amount of diathermy. As a previous discusser has remarked, I would like to know whether the difference in the type of disease will act either as a bar or an indication for the use of these two modalities.

DR. N. J. SEYBOLD (Cleveland, Ohio): Has Doctor Chapman noticed any superiority in the ultra violet lamp over the carbon arc lamp? In treating the so-called dry and moist T. B., what are his percentages of cures relative to each type?

DR. DESAULNIERS: May I ask at what stage, at what temperature you keep the patient in bed? In Maine we have a specialist who puts them to bed. He kept a patient in bed a year because she had temperatures of ninety-nine and one hundred.

DR. LAWS: I do not wish to be critical about this subject, a subject that I know very little about, I mean the use of physical therapy. However, the treatment of pulmonary tuberculosis is so important to all of us that I feel, as some of the men have requested, we should know something of the technic that is used and the indications for diathermy or x ray treatment. This is the first time I ever attended a physical therapy meeting, and I stopped off here after having attended the International Union against Tuberculosis and the National Congress of Tuberculosis held in Washington, to see what additional information I might obtain relative to the treatment of pulmonary tuberculosis. The consensus of opinion, both from our own workers and those abroad on the treatment of tuberculosis was that the old tried rest cure, good food, fresh air and the attempt to assist nature in walling off the condition was the main treatment in tuberculosis; that pneumothorax used in selected cases, one-sided cases that were very active was a valuable and definitely established treatment; that in some selected cases the cutting of the ribs and a partial collapse of the lung, known as thoracoplasty, was of value; that in a few, a small percentage of cases, the cutting of the phrenic nerve and the paralyzing of the diaphragm on the affected side was of some value.

I don't see how diathermy or x ray which breaks down fibrous tissue which nature has thrown up to try to wall off the enemy is going to help. I can't see how the tearing down of the fortress and turning the enemy loose is going to be of value. It strikes me that it will be a dangerous procedure. However, I am free to acknowledge I am trying to learn and I hope the Doctor has some publications giving his technic that will be of value to us in trying out some of the things that he recommends.

DR. ANDREW SARGENT (Hopkinsville, Ky.): I want to ask a question. In his essay he made no reference to age. I agree with him thoroughly that it is a systemic disease and not a local disease, but the underlying condition is systemic and the tubercular bacilli are but an effort of nature to clean up degenerative tissue. I would like to hear discussion in closing his paper to what effect age has upon the durability of the disease.

DR. CHAPMAN: Before attempting to discuss these questions, I wish to say that my talk of necessity was of a general nature. I am introducing a comparatively new subject, in the treatment of tuberculosis.

The first question the Doctor asked was whether I use the same treatment with a fibrous pulmonary tuberculosis that I would where there is a predominance of caseation and fluid formation. No. We must remember that we are primarily physicians and must adapt our treatment to the condition.

In our district the majority of the cases are of the fibrous type. We have there mainly a type of tuberculosis which we call miners' consumption, the condition is known in the literature as silicosis. If you listen to the man's lungs with a stethoscope, you hear little save subdued breath sounds. From the x ray plate you would think both lungs were entirely destroyed, the shadows are so dense. The fine dust from the cuttings of the drills sets up an irritation with-

in the bronchioles and even out into the air sacs. This causes the formation of fibrous tissue which limits the excursion of the lungs and invariably terminates in this so-called Miners' consumption. In these cases the x ray is our most valuable agent. I use the x ray to break down this fibrous tissue and with exercise and rest and other hygienic and dietetic measures most of these cases show improvement. Occasionally we get one that has reached the stage where nothing will help him.

In what we call quick consumption, one where we have cavities with a large amount of sputum, to use a simple term, "the soft type", the x ray is of very little value. In these cases I believe the ultra violet light is our most valuable physical agent. Unfortunately, unless these cases are caught early, they progress to a speedy termination. Occasionally this latter type of disease is benefited by the judicious use of diathermy.

Regarding calcium, we all know the great susceptibility of lung tissue to the tubercle bacillus, especially in parts of the lung where the blood supply is not as good as it is in others. We all know that the infection usually starts in some part of the body, where the vascularity is somewhat limited. That is one reason we have spinal tuberculosis. Around the lungs it will start in the hilus or up in the apices. We seldom find the beginning of tuberculosis in the parts of the lungs that are vigorous and active all the time. It is like a thief in the dark.

The fact that the lymph glands act as barriers to the introduction of infection into the body and also that the lymph contains a high percentage of calcium would indicate that calcium has some bactericidal properties. It may be the element that activates the cells and it may be that the calcium is a peculiar property of lymphoid tissue, however, there is no question about the lymph glands being protective agents in the spread of infection.

The number of meals are limited to the ability of the patient to take nourishment. I feed these patients to their capacity; where they have weak stomachs and are unable to take considerable quantities of food at one time, they should be fed more often. In febrile cases I advocate feeding at least five or six times a day a small amount of easily digested food, mainly some dairy products. Milk is our old standby. However, as the patient improves and is able to take food, I give him a very liberal diet, in fact, what we might call an increased diet.

The next question I have is, has the ultra violet lamp an advantage over the carbon arc? It has been generally conceded by scientists that it is the ultra violet rays of the sun that have the curative effects. This was first discovered by Rollier and has been substantiated by many observers since. It was found they could not obtain the beneficial effects in tuberculosis in London and many low land cities that were obtained in Leysen, Switzerland. Many of the physicians who made the pilgrimage to Leysen went home and attempted to establish sanatoria for tuberculosis and were disappointed. It was soon discovered, however, that the curative effects were due to the ultra violet rays of the sun. Pure sunshine contains about seven per cent of ultra violet rays. These rays are easily inhibited by smoke and dust particles in the air. Even common window glass is opaque to their passage, and in a smoky low land city, a city like Chicago perhaps we get no ultra violet at all. On the other hand, the infra-red rays, of which the Solar spectrum contains approximately eighty per cent, have great penetrative powers. These rays in high percentage are detrimental in the treatment of pulmonary tuberculosis because they produce a vascular stasis that seems to promote the progress of the disease. This congestion differs from the healthy hyperemia we get from diathermy in that it is of the nature of a hypostatic congestion where the blood does not flow actively but tends to engorge the tissues.

The ultra violet lamp that is on the market today gives off from thirty-three to as high as sixty-five per cent of ultra violet radiations; the carbon arc gives off approximately the same as sunlight. It is claimed by the manufacturers of the carbon arc that the percentage is as high as seventeen per cent but that is open to discussion. My next question is, the percentage of cures in moist or dry tuberculosis. The dry type responds the most readily to physical agents. The moist type, as I mentioned a moment ago, is the most difficult to treat, and where the case is fairly advanced, it usually progresses rapidly to a fatal termination.

When to keep the patient in bed. I would not keep a patient in bed for a year if she had a temperature of ninty-nine. I have even found patients whose normal temperatures seemed to be ninty-nine. Where a patient is running an afternoon temperature of 100, I would have him in bed at least a portion of the day, for instance two or three hours in the afternoon. I would allow him up in the morning and perhaps for a short while in the evening.

Now the gentleman from El Paso mentioned breaking down fibrous tissue. That is something that I can't discuss intelligently in the time that is allowed me. I will say, remember the pathology of a tubercle. In the center we have caseation with living bacilli, surrounding this is a ring of lymphoid tissue in which there is a certain amount of new fibrous tissue and on the extreme outer circle there is a capsule of fibrous tissue. These are growing fibrous cells with which nature is trying to wall-off the infection. If that fibrous tissue has come to the point of stamping out the infection, the x ray in the amount given will do no harm, it will not break down healthy fibrous tissue. If those are growing fibrous cells, if the tubercle is spreading, it will tend to break it down gradually and give nature a chance to absorb the spreading infection. I repeat, if the case is already limited, if it is stamped out, the x ray in the amount given will do no harm, it will not break it down. In the growing tissue where the tubercle is spreading, it will absorb it so gradually that it gives the phagocytes of the blood stream a chance to get in their work.

Dr. W. H. Moorhead (Stuttgart, Ark): In view of the importance of the subject, I move you Dr. Chapman be given five minutes to give us the technic, that is what we want, that is what we need to know, how he gets these results. Other fellows are not getting them, let's learn how.

Chairman Elsom: It would be of immense interest, of course. We have one or two interesting papers left over from yesterday. However, if it is the pleasure of this audience, we will allow Dr. Chapman a brief period. Motion seconded and carried.

Chairman Elsom: Doctor, we will extend your time.

Dr. Chapman: I will discuss mainly the physical side. As a routine measure we give one treatment with the x ray at the beginning of each week and on the following days alternate actinotherapy and diathermy, being guided, of course, by the reaction of the patient.

The specific technic, our routine technic with the x ray, of course, is varied to suit conditions. We use mainly a nine-inch machine, three to four millimeters of aluminum, usually a seven-inch back up, five milliamperes for five minutes front and back. We use a wide cone instead of a localizer. We give these treatments for three weeks after which another x ray is made of the lungs. After a space of two or three weeks we may repeat this treatment with the x ray. I have never had a dermatitis following it.

In cases where I have huge lymphoid masses in the mediastinum, I use the deep therapy x ray, giving from 140 to 200 k. v. for thirty minutes front and back. I give one treatment and then await results. I often repeat each week for perhaps three treatments. We have to study each case individually and vary our treatment to fit the condition.

On one case of peritoneal tuberculosis with huge lymphoid formation that looked like fibroids all through the abdomen I used the deep therapy machine, 200 k. v., four milliamperes, the usual filter, 50 cm. F. S. D. Those masses vanished like magic and in three months the patient was able to be at work in the fields.

Our technic with the ultra violet lamp is varied somewhat according to the type of the individual. I used to state in the literature that we started a blond with one minute and a brunette with two, but this doesn't work out. There is a wide variation in the power of these burners, especially after they have been used a while. I leave the amount of exposure somewhat to the technician who is skilled in her work. I endeavor when possible to get a healthy bronzing of the skin. There seems to be some relation between a healthy bronzing of the skin and improvement in the disease. The skin of many of these tuberculous cases is very dry and scaly and they are quite refractory to ultra violet treatment. In some, I have even advocated trying to soften up the skin with inunctions of oil. These are the cases that seem to require the use of the radiant lamp.

If we can stir up a healthy perspiration and then massage the skin with towels and bring as much blood to the surface as possible, we get better results with the ultra violet lamp. In febrile cases we must use extreme caution in using the radiant heat lamp because quite frequently it will produce effects that are comparable to a mild or even severe heat prostration.

Now, the Doctor mentioned the findings of what you might call organized medicine. We accept all those things, they are correct and we must practice them, but if we can bring in any additional factors which will tend to a successful issue, it is our duty as doctors to do so. If we find something which through our experience seems to bring beneficial results, I think we should mention it to our fellow physicians and let them try it, always using caution and not accepting one man's word as authority, but taking new suggestions and using our own training and studying the cases individually.

SKIN BLEMISHES*

HERMAN GOODMAN, B. S., M. D.
NEW YORK CITY

Skin blemishes are different from skin diseases. A blemish is something the patient wants removed because it prevents, or seemingly prevents the possibility of marriage, or else it just keeps the possessor awake at night. Most blemishes are harmless, but the one exception is so fraught with danger to life, that the consideration of blemishes must be part of the art and science of the doctor of medicine.

Hypertrichosis

The blemish which comes to me most often as a dermatologist is that of excessive hairs where they are not wanted. Interestingly enough, I find that one out of each ten patients who claims excessive unwanted hair is a man. The question in therapy is how to get rid of the unwanted hair. First, you choose your patient. Don't take a patient if you think you will make matters worse instead of better! Send such a patient away. Advise such a patient that promises may be made to him by the ignorant or the unscrupulous which cannot be fulfilled. Tell the patient about the inherent dangers of poor technic.

What kind of a patient do you want to select? For myself, I prefer the easier ones now. If a man or woman comes in with gross hairs which have been withdrawn by extraction a great many times, which are stubby, which are coarse, and if there are not too many of them, that is the ideal case. If the entire surface of the face is covered with a veritable beard of such hairs, and the patient is willing, and the doctor does not tire easily, one may do wonders. Incidentally, there are no virtues in the advertised depilatories.

*Lecture delivered at the fifth annual meeting, American College of Physical Therapy, Chicago, Oct. 19, 1926.

I have found doctors and interns acquainted with galvanism who came to me for hypertrichosis. But not all know how to use it. Few of the doctors who do, stop to think how it works. I am not going to tell the why and wherefore now. But I will bring to mind an alliteration which should be helpful. I speak of the letters "N" and "P". The "N" represents negative; it also stands for "Needle". The negative pole of galvanism for the removal of hairs must be attached to the needle which will be introduced into the follicle. The "P" is for positive. Likewise, it is for patient. The positive pole is held by the patient.

Properly applied, with the negative pole to the needle, one does not send the steel of the needle into the patient's skin. If the polarity is reversed, and the positive pole of galvanism is attached to the needle for the removal of hairs, steel is deposited into the skin and black marks are there for all time. So remember the alliteration: N to N, negative to needle.

One should undertake the galvanic treatment of superfluous hairs only if fresh, with untired eyes, and with good eyesight. It does no good to miss the follicle. It does no good not to reach the growing place of the hair which is the papilla. The destructive action of the chemical changes brought on by the negative charge of the current must reach and destroy the papilla in order to keep the hair from growing back again. Don't try to do a follicle the second time at the same sitting if the first attempt was a failure. Leave the unfinished one alone.

The number of milliamperes to be used is based on the amount which will do the work and not cause unnecessary smarting. Two or three milliamperes do not pain, and are effectual. The appearance of the fuzzy ooze from the top of

the follicle is supposed to be a sign that the destruction is complete. Sometimes you do not get the ooze and the job is done, and more often you do get the ooze and the hair grows again. The reason is, and you can try this at home, that the ooze appears no matter where the action of the current takes place, and if the needle is against the side wall of the follicle, destruction is taking place there, but the follicle is left intact. You must get the ionization effect on the papilla.

I mention x rays in the treatment of hypertrichosis only to condemn it. Do not be gullible, and believe that any machine which can destroy the active growing cells enough to prevent hair is not x ray, either. The pathological result of excessive Roentgen raying is permanent loss of the papilla which results in alopecia. When permanent alopecia results from an x ray exposure you have passed the physiologic limit, and entered into the pathology and all it implies of an x ray dermatitis. The ultimate result of the atrophy, telangiectasia, and possible malignancy is far more dangerous to life and happiness than the unoffending hairs for which the Roentgen ray was applied. The only time when such treatment is in order is to save sanity or perhaps life in the oversensitive, whose threats of suicide may be culminated.

Pigmented Mole

Perhaps the next most frequent class of skin blemishes which comes to me is the pigmented mole. If it is a slightly colored one, slate gray, without hairs on it, and further, if it is single, I do not undertake its removal unless I have the opportunity of making a regular surgical job of it either by actual knife removal which I do *not* advise, or else by wide removal with one or another of the cutting currents of high frequency.

If the mole is deeply pigmented, and has hairs growing through it, I am less worried about it, and if the primary moles are numerous, I believe that they are without danger. If the mole is pigmented, and is hairy, and if it must come off, I take the hairs out first by either of the methods suggested for hypertrichosis; galvanism or high frequency. If you do not remove the hairs and destroy the growing papilla of the follicle, regrowth of the hair may be unsightly, and if as the result of removal of the mole, the follicle is distorted you may have difficulty subsequently in getting to the growing end. The hair may grow curling up within the follicle resulting in cyst formation.

Pigmented moles of all sizes may be removed. Ordinarily, those about the face are small enough for proper work. If they are too big, and one foresees the need of plastic surgery and skin grafting to make up the deficiency, prepare the patient in advance. Unless there is great need for removal of such a mole, I would leave it alone on the basis that the end result of interference may be more displeasing to the patient than the mole. I have removed pigmented moles which were several inches square, and the resulting scar was one which had the tendency to shrink, and get more linear with time. Needless to say this was not from the face.

Pigmented and hairy moles may also be eradicated by proper use of galvanism. The needles are passed through the undersurface of the mole from a number of angles, and the current turned on each time. Here too, it is essential to remove any hairs before attempting removal of the mole. Carbonic acid in snow form may be used; likewise liquid air.

I will close this section with this caution: If there are no hairs on a pigmented mole, be careful, and if there are hairs, get them out before removing the mole by the modalities mentioned above.

Telangiectasia

It is not so popular to have dilated vessels on the nose any more, and it does not mean a

full cellar either. Many persons come to me to have such dilated veins made less conspicuous. Of course, habits of eating and drinking must be corrected in order to minimize the possibilities of recurrence. Tea and coffee and spiritous liquors are to be forbidden. The removal of these dilated vessels, as from the nose and flush areas of the cheeks, depends on the modalities employed. If I use galvanism, I do exactly as I do with the removal of excessive hairs. I make certain that I am in the lumen of the vessel. I try not to get beside it, for that will do little good. It makes little difference if you enter the distal or proximal part of the vessel. If you enter the vessel and if your galvanic current is properly applied the wall will be collapsed enough to prevent that particular vessel from showing up again.

Diathermy current or high frequency current may also be used in this work. The bipolar use of the high frequency is meant. You measure the current in the following manner:

Set your machine on its lowest output arrangement. Strike the needle you are going to use against the hand electrode which the patient will hold (remember there is no polarity in high frequency—it makes no difference which pole is atttached to the needle) and arrange the setting of your output so that the milliamperage registers 200 in short circuit. That is the setting to use. Get the needle into the vessel for galvanism, and apply high frequency for a fraction of a second. This is the technic I alluded to earlier when I said that high frequency may be used for hypertrichosis. Don't keep the current on too long while attempting the removal of a hair or the destruction of lining of a dilated vein.

If the vessels on the part are grouped about a central bulbous protruding knuckle of vessel, or if the dilated vessels are part of a nevus araneous or spider nevus it is easier to destroy the blemish by using a fine cautery point. I use the cautery points which the eye men use (incidentally, the best tools for the dermatologist considering this kind of work are the tools of the eye specialist; buy a case from one of the houses dealing with them and you will enjoy the use of the small scissors, scapels, forceps, etc.). I get into the center vessel, with the cautery point cold, and when I am certain that I have the right place, I press the button, turn on the current and heat the cautery point in the vessel to be destroyed. Of course the superficial layers of skin are destroyed also. The scar is a minute one, and the patient prefers it to the original blemish.

The remarks made apply to the treatment of rosacea.

Nonpigmented Moles

There are all kinds of nonpigmented moles. Some run along lines; the nevus linearis, or nevus unislateralis. These usually are on one side of the body only. The verrucous type is above the level of the skin, but the change in the corium or true skin is what must be remedied for cure. The nevus cells are low down in the corium, so if one wished to eradicate such a mole, it would be necessary to reach the part in the depths. The superficial offending part is the end product. It is not sufficient to remove that. In the following type of work, we must consider the site of the primary change. No matter that the growth is above the surface of the surrounding skin, the part to blame is below it. This brings up the question of regeneration. The important thing is that you do not regenerate the corium. Any destruction of the corium means a scar. It is only the epidermis which has the faculty of regeneration. When you strike the corium or true skin, you get connective tissue scar, not regeneration of the same tissue. It is true if you destroy through to the basal layer of the epidermis, you get physiological response, and in the natural evolution of the layer cells, the epidermis is regrown. But

it is different in the corium. It is good to remember that destruction of the corium spells scar.

In the type of work now being described, one good rule to follow is: Get your end result after the operation. By this I mean, do *not* get the appearance you seek of a flat surface for example in a warty growth while working. This applies to galvanism, high frequency, cautery. These modalities excite tissue reactions, and if you have already flattened out a verrucous condition, the tissue reaction will continue and a depression will be caused which will be as unsightly to the patient as the original overgrowth. I very often do not remove a wart or a mole at all. I merely excite a tissue reaction by means of the modalities at hand, and in a week or ten days, the tissue reaction to the application of the galvanism or to the high frequency is such that the wart or mole drops off, leaving the skin on a level with the surrounding skin. If I had had the tissue reaction take place on the surface already made level with the surrounding skin, the result would be a depression.

I advise doing less than I want done in this harmless type of growth as wart, non pigmented mole etc. Of course, I do not pamper pigmented ones. If the result of this letting the body do its work after the initial impulse from the modalities employed does not give the proper result it is an easy matter to give another application. I find now that it is easier to restrain myself from stepping on the foot switch than it was some years ago. In consequence, my end results are better.

Vascular Nevi

Flat vascular nevi are difficult things for me to handle successfully. I know of course that some men have reported brilliant results especially with the so-called water cooled mercury arc in quartz. My own work with this modality has never been good enough to warrant continuing it.

I have been more happy about the results in the cavernous tumefied vascular nevi. The insertion of the radium needle gives wonderful results. Galvanism may likewise be employed, but frankly, I am not so happy about using it. I am not certain that galvanism as ordinarily applied can stop the bleeding. I have used the galvanic current as it comes from the street mains on direct current electricity for experiments as a dividing instrument, however, and I know of the work done by pioneers in this direction. I rather like the high frequency for this kind of work.

Carbonic acid snow is good also. The vessels actually contract, I imagine, at least the color leaves the nevus, and most patients are satisfied. The mothers are happy, and the babies don't know about it. Incidentally, the nevus does not have to be present at birth to make it a birth mark. It is hard to make mothers understand this.

Xanthoma Palpebrarum

These changes in the skin about the eyes come on with age, and whether due to degeneration of the muscles or not are removable if one is delicate enough and has control of his modailty. I use the galvanic current with very fine needles. If the needles one buys are not fine enough, I use a little stone and wear down the needle as well as the end of the fingers while doing it. Take time, use little current in milliamperage, and don't try to do too much at one time.

There is a report that the use of light energy will cause the disappearance of the xanthoma palpebrarum.

Verruca

There are two types of warts. One kind is the juvenile or flat wart. These are usually anywhere on the face or hands and in great number. It is usually impossible to consider treating

these one at a time. X ray is the best for this type of wart. The use of mercury internal and out has been proposed for juvenile warts.

Verruca vulgaris is the second type of wart. The method to use for the removal of this type of verruca is the high frequency monopolar spark. The monopolar is called the Oudin. I have the manufacturer of my apparatus construct the coils in such a way that I have very short intense sparks from the Oudin terminal. I do not want the long blue wavy sparks. Such are good to use with the vacuum tubes, and since I find no virtue in the vacuum or even the non vacuum tubes, I find no use for this type of spark. For the excitation of the vacuum tube, buy the barber shop coil for three dollars and a half.

A word now on how to use the Oudin spark. I believe that the needle should be placed where the activity is going on. In the case of the wart one should know the pathogenisis of warts. One should then go to the site of the wart which causes it to exist. One would not remove the excrescence which is a by product. The Oudin current arcs. The belly of the arc is the effective part. So the needle is held close to the part which is to be destroyed The needle may be introduced into the skin. The sparks should be short but intense. You must dispel the actvity of the papillary body to cure the patient of his wart. I do not take the wart off when I am working. I allow the reaction to go on to completion.

The type of wart known as 'venereal wart' is hardly to be classified as a skin blemish, but this type lends itself readily to the proper use of Oudin current. The fact that the usual sites of the venereal wart are moist should be taken into consideration.

Acne Keloid; Keloid

This affliction, usually found on the back of the neck requires a consideration of the factors mentioned up to now. The scarring is considered to be the results of chronic inflammation with its attendant reaction in the corium leading to scars.

Keloid is another skin blemish. Before going into the art and science of the removal of keloids one must decide what was the source of the overgrowth. If from a previous operation, one would hesitate to operate on the keloid, since, it is possible that a new keloid probably larger than the preceding one would result. Primary keloids, possibly from unnoticed injuries, are also likely to recur.

I have removed keloids by diathermy, and also by the use of the surgical diathermy.

Scars

There is a great difference between scars and keloids. Scars of course may become keloidal. In the pigmented race, the scars most often become overgrown. In certain white persons the same tendency is observed.

I am often consulted by persons who desire to have scars of normal extent made less noticeable. In fact a number of plastic surgeons send me their patients for this. I use galvanism with some modicum of success.

Miscellaneous

I will name a number of conditions which might conceivably be grouped with skin blemishes which are amenable to proper application of modalities of physiotherapy.

Callositas, clavus, cornu cutaneum, fibroma, keratosis, lupus, lymphangioma, milium, molluscum, neurofibroma.

Accessible Malignancies

If the accessible malignancies are included, one finds that surgical diathermy is ideal for basal cell epithelioma. . The epithelioma

requires quite a lot of work. I would say not to attempt to treat an epithelioma until one was well acquainted with the histologic picture of this type of growth as seen under the microscope. Then, too, the individual epithelioma should be properly diagnosed clinically. It would not be so happy an end result if one mistook a prickle cell epithelioma for a basal cell epithelioma. Once certain of the clinical diagnosis, one can do beautiful work. One must do enough on the lesion. There should be no half measures. Don't do a little now, and a little week after next. That is no good. The knowledge of the pathology is the clue to the therapy. In basal cell epithelioma, it is the rapidly uncontrolled growth of the basal cell layer cells which must be controlled. Any form of therapy which promises utter destruction to the revolutionist cells promises relief from the growth. Basal cell epitheliomas do not send metastases into the nodes or into distant parts of the body.

If one uses the high frequency currents, one must be careful to get to the basis of the epithelial overgrowth. One must destroy the site of the growing cells. It is not enough to destroy the evidence on the surface. I use the Oudin. I use tiny hot sparks. Yet the sparks need not be too hot. You can do a basal cell epithelioma through tissue paper without igniting the tissue paper. You require an Oudin spark which will reach the growing basal cells infiltrating the corium. If your spark carbonizes the surface, and makes armor plate covering the lesion, your application of the current is fruitless.

The easy accessibility of the skin has offered an opportunity for quacks and quackery. Persons who would not attempt therapeutic measures for similar pathologic entities within the cavities of the body have no hesitancy when the condition is on the skin. Great and even small cities are flooded with so-called beauty specialists who have had no scientific training. Education of the people who form the clients of these so-called beauty specialists must be undertaken. In the mean time legitimate physicians should be prepared to undertake some tiring and boring work in cosmetic dermatology.

Discussion

Dr. Waddington: I want to emphasize that neither the positive nor the negative pole of the galvanic current is aseptic. We have been taught neither pole is aseptic, therefore we use the needles. When you use the negative needle especially have it sterilized because these are cellular operations and you don't want to carry infection into the blemish.

I told you yesterday that you cannot get along without a galvanic current. This talk illustrates the fact.

Some machines give you the direct current directly from the mains. It is, therefore, important to test your machine for polarity.

Dr. Goodman said he did not use galvanism for nevus vasculosum, I don't know why. I am not a dermatologist, but I have had one or two cases. A case was sent to me in Detroit some years ago by a physician. He gave an anesthetic to a baby ten months old, who had a large vascular nevus at the junction of the frontal and facial bones. We used the positive pole, using, of course, a platinum needle, and we secured a beautiful result. I don't know why Dr. Goodman made that exception.

In moles and warts I differ a little from Dr. Goodman; we all disagree sometimes. The technic is about the same. If I have a polyoid mole of some kind, I dessicate that, being careful not to go to the true skin, and I will take the pedicle and dessicate that. Never mind the top, dessicate the pedicle. Snip it off with a pair of scissors or a safety razor blade and then apply just enough current to get at the basal cells so that they will not proliferate again. That I think is better technic in same cases. In the flat moles, as Dr. Goodman told you, don't give too much so as to get down into the basal cells in the true skin.

Dr. Judd: I would like to ask Dr. Goodman if there is any advantage in neosalvarsan in warts. We see it in the journals frequently and there has been discussion about it.

Dr. Morris A. Hershensen (Pittsburgh, Pa.): Dr. Goodman showed that in removal of warts he gets

down below the projecting portion in order to destroy the deeper sections and in his diagram he inferred (perhape I misunderstood him) that he sticks the needle into the skin. I would like to know about that. My experience is that I can't give Oudin current if the needle touches the patient. How do you get into the deep layers of the skin and still not touch the patient?

Dr. E. D. Jackson (New Castle, Pa.): I would like to ask if it would be advisable to use the jump spark on nevi, showering the nevi with the sparks rather than placing the needle in the epidermis. I would also like to know his experience in the use of water cooled lamp under pressure, say half an hour to an hour.

Dr. Goodman: Regarding the precautions which one should take, of course one should always be supercareful. The galvanic machines which take current direct from the mains are not the best ones to use, they are not the safest. It is possible to use them. You get results if you watch everything carefully. I bought a machine at home that takes the street current and has a motor generator and it generates the current for the patient's circuit right on the machine and has a polarity indicator. I can tell by which way the needle deflects which side is negative and which side is positive. They tell stories in the East that may or may not be true about certain professors from the West. We will reverse the story for this part of the country. A certain eastern fellow came to Chicago to see a man work and the nurse applied the cords and then put the green cord to the needle, and the professor from the East said, "That is no good."

The nurse said, "Why not?"

He said, "The green cord is never negative, it is always positive." Don't make that mistake.

When I spoke of using galvanism on the vascular nevi, I didn't consider the type of work Dr. Waddington spoke of where you take the baby and use massive galvanism. That is what he probably did, as I understand it. It was Dr. Massey's type of work. That is outside of this type of conversation.

Regarding salvarsan for warts, I think it is a good waste of salvarsan.

I didn't quite follow what the gentleman over here had to say regarding not being able to touch the patient and getting inside the thing. If I remember rightly, I spoke of a wart. I said, and I say again, it would be foolish to treat the upper part of the wart; you have to get down into the proliferating cells.

Dr. Hershensen: Did you stick the needle into the skin?

Dr. Goodman: That is the only way I could get it there.

Dr. Hershensen: How can you get sparking from the terminal?

Dr. Goodman: Go home and try it.

The gentleman over here asked about treating the vascular nevi with the jump spark. Well, we will make a nevus out of this thing, on the blackboard. We will draw a couple of blood vessels that are very big. We will bring a couple of blood vessels up into here and make it a good nevus. The spark is reaching the epidermis. That is not going to help down here very much where the vessels are.

Regarding the water cooled lamp treatment of vascular nevi, as an intern I did that, and as I have said time and time again, I haven't got the patience. There are enough authentic reports of people who can sit and worry and take a year or eighteen months for those things. Dr. Nagelschmidt, by the way, has some marvelous stuff along that line. Over in Germany they have more time. He keeps them coming ever so long as he has some really remarkable changes that have taken place in the port wine marks, even very, very extensive ones, half the body for example. As far as pictures are concerned, they have entirely dissapeared from treatment by using the water cooled mercury arc in quartz. I am not so good at it, though.

I will close the discussion by bringing to mind the fact that a machine cannot practice for us. We require an intimate knowledge of the pathology existing in the conditions we seek to remedy. We must have an insight into the effects of the modalities we employ. We should be fairly good clinicians. By being physicians first, and physiotherapeutists last, we will make the greatest advances in our chosen profession, the art and science of medicine and surgery for the betterment of mankind.

EDITORIAL

ARCHIVES OF PHYSICAL THERAPY, X-RAY, RADIUM

A Journal of Ideas and Ideals.

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Chicago, Illinois

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Sixth annual meeting American College of Physical Therapy and Clinical Congress on Physical Therapy—Hotel Sherman, Chicago, October 31 to November 5, 1927.

BETTER TRAINING FOR PHYSICAL THERAPY TECHNICIANS AND PHYSICIANS

The increased demand for thoroughly trained physical therapy technicians has forcibly brought to the attention of the leaders in the special field the necessity of more intensive courses of instruction. Unfortunately this need has not as yet been adequately met. Several institutions have undertaken the obligation of giving more or less graded physical therapy, but the demand for these courses is much greater than the present means of handling it. The results are the inevitable springing up of all sorts or short courses, commercialized beyond words, newly organized schools with fantastic names and the offering of lithographed diplomas upon the completion of a month's study. Worse than this is the opportunity afforded and quickly taken advantage of—extension courses in physiotherapy—by correspondence schools. Imagine the teaching of anatomy, physiology and other branches, then the theory and practice of physiotherapy, to non-medical men and women by mail instruction! What could be worse? Yet such a condition exists and these mail schools are reaping a heavy harvest.

It has recently come to the attention of the editor that one such school in Chicago is offering to make so-called physiotherapists in a short time. Upon completion of the course, this school bestows upon the student a "beautiful" diploma, handsomely engraved, which attests to all the necessary qualifications of a fully trained physiotherapist. This leads us to the question—"who is a physiotherapist and when?

The New York authorities have handed down definite data on this subject, but to say that it is satisfactory is not to voice the sentiments of those in a position to express themselves intelligently with reference to the prob-

lem. None of our other states has given this matter consideration, but the time is not far off when some definite ruling must be handed down.

What are we who wish to uphold scientific physical therapy on a high plane to do? How can we keep this unit of the triad of medicine, surgery and physical therapy from the infringement of cults, quacks, and an untrained laity who suddenly desire to become "overnight physiotherapists". The answer is simple. When our medical schools and higher institutions of learning will as a unit interest themselves sufficiently in this newer field to organize and offer under-graduate and post-graduate courses of instruction in physical therapy, so that those with the proper preliminary requirements can pursue them, the pseudo-schools and mail order diploma mills will cease to thrive. The outlook is indeed good, for several colleges have already set their wheels in motion for such newer training. But many are still looking on, watchfully waiting, for what?

The hospitals, too, can do their bit toward this better training. If physical therapy was offered as part of a nurse's training and opportunities were afforded for more intensive practical application for those who wish to specialize in this work, the graduate would not seek the help of manufacturers to help make them physical therapy technicians.

As the situation now stands a large majority of nurses must acquire their training in the application of physical agents while employed in physician's offices. This method is far from ideal, but it is superior to the half-baked, theoretical courses offered by equipment manufacturers through their sales organizations and sales literature.

The teaching of physical therapy in its fundamentals is an important beginning for the novice. This can often be done in a short time if the student possesses the necessary preliminary education. For the non-medical beginner it is paramount that this teaching be performed in university style. Home study methods are sometimes successful in theoretical branches, but utterly fail in medical or allied subjects. Even the physician should not be encouraged to acquire his knowledge of physical therapy in this manner. Certainly the practical application of physical agents had best be learned by the novice from the experience of those who are already trained. No method is better than actual practice based on careful observation in clinics or in private work.

A. R. H.

ANNOUNCEMENT OF THE CLINICAL CONGRESS ON PHYSICAL THERAPY AND 6TH ANNUAL MEETING AMERICAN COLLEGE OF PHYSICAL THERAPY

October 31st to November 5th, 1927

Hotel Sherman—Chicago

Elaborate plans have been made for this year's clinical congress and meeting. As last years program was so successful from every point of view, the one now being arranged will in a large measure follow out the same plan. The first three days will be devoted to instruction classes. Smaller groups for the purpose of more personal instruction have been arranged and there will be a greater amount of demonstration work than heretofore. Following the teaching course a two day session of addresses and conferences will be held. Sectional meet-

ings will prevail the same as last year. Thus there will be one section on medicine, diagnosis, pediatrics and dermatology; a second section on surgery, gynecology, urology and allied branches; and still another section on eye, ear, nose, throat and oral diseases. The final day of the meeting will be devoted to hospital and dispensary clinics. These will be more adequate to handle a larger attendance this year than last.

Some of the country's most prominent teachers and clinicians have accepted invitations to address the congress. The instructors will be the best men available in the various branches of physical therapy.

As it will be necessary to limit the numbers in the groups planned for teaching and demonstration purposes, physicians and technicians who plan to attend the 1927 classes are urged to communicate with the chairman of the convention committee as early as possible.

A fee of ten dollars will be charged for attendance at the classes and a registration fee of five dollars for attendance at the meetings and clinics. Fellows of the College who are in good standing and have their 1927 membership cards will be exempt from the payment of the registration fee of five dollars to the meeting, but fellows must pay the usual fee of ten dollars if they enroll for the instruction classes.

An unusual feature of the 1927 session will be the scientific exhibits. Several are already arranged. Physicians or institutions desiring reservation for space for scientific exhibits in x ray or physical therapy, are asked to communicate with the undersigned at once as only a limited space is available for this purpose and reservations are being made in the order in which they are received. About four fifths of the space available for commercial exhibits has been contracted for. Manufacturers and dealers desiring reservations should send for plat at once. The exhibit hall covers a space of 14,000 square feet and is one of the best in America in the way of facilities.

Preliminary programs will be available and may be had on request.

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IS IT IGNORANCE OR TEMERITY?

Recently there have appeared new editions of text books pertaining to Fractures and Nerve Surgery, and in neither of these is there any reference to physical therapy. One of the books devotes a few pages to the galvanic and faradic currents, and shows some illustrations of antiquated and obsolete machines and coils, using the old wood cuts of years ago.

It seems with all that has been written and actually done in restoring bones, joints and nerves with physical therapy at least one chapter should be devoted to this important subject. It certainly cannot be ignorance, for the reason that in every medical magazine of recent years some substantial article on the value of physical therapy has been published. Again medical societies have been organized for the purpose of advancing knowledge in this medical specialty. These meetings have been reported both in the lay and medical press to such an extent that the laity and profession alike are discussing its virtues. Courses in physical therapy have been added to the curricula of some of the leading medical schools of our country; namely, Harvard, Columbia, Rush, Northwestern. The American College of surgeons has recognized the importance of physical therapy and has recommended such a department in accredited hospitals. Many prominent surgeons have

added the use of physical agents in their preoperative and postoperative work and report splendid successes with the various physical measures. In view of this recognition which this form of therapeutics has achieved during the past few years, it would seem that those who write text books ought to be sufficiently informed to take cognizance of the subject.

However, it may be temerity on the part of the author, fearing that his book will be subject to severe criticism at the hands of his readers. This should not be so. Authors should be scathingly criticised for neglecting such important material. Physical therapy has passed the experimental stage, it is no longer on the defensive, but is now a reality with definite indications. Its value is now unquestioned, and an author who fails to recognize this branch of therapeutics and accord it sufficient and proper space is denying his readers of available information which they should have. A book on treatment is not complete unless it contains suitable references to the value of physical therapy.

Frank H. Walke

"THE CYCLE OF COMPLETION"

In "A Brief Review of the Hospital Market", by Frank Bruce, appears a section under this caption. Bruce believes that the year 1927 will proves an excellent equipment year. No doubt Bruce has in mind, among other equipment, physical therapy appartatus. Hospitals are woefully lacking in adequate departments of physical therapeutics, or more specifically electrotherapeutics. The recent tendency is all in favor of this reborn form of therapeutics and the time is not far off when all hospitals will be fully equiped from their very inception.

When a study is made of the proper budgeting of hospital construction, those who have this matter under control should at once reserve adequate quarters and sufficient funds for a fully equipped division of physical therapy. No hospital is now complete without this. Certainly a hospital organization should not wait until the inclusion of a department of physical therapy becomes an absolute requirement for class A recognition.

With this "cycle of completion" mentioned by Bruce, and predicted by him as taking effect this year, it is hoped that many new departments of physical therapy will be instituted. Equipment in itself, however, does not really complete such a department. There must be a thoroughly trained individual to take charge and make the most of the several agents which the reconstruction period of the World War and the period since have demonstrated their great value in the care of the sick and injured.

SECOND A. S. I. SYMPOSIUM ON STOMATOLOGY

The second symposium on stomatology of the International Stomatological Association (A. S. I.) published by the A. R. Elliot Company, which appeared in *The Medical Journal and Record* (January 5, 1927), contains eleven original contributions by Alfred Owre, D. M. D., Minneapolis, Minn.; Frederick C. Waite, Ph. D, Cleveland, Ohio; Professor Oskar Romer, Leipzig, Germany; Anthony Bassles, M. D., New York, N. Y.; Alonzo Milton Nodine, L. D. S., London, England; Joseph W. Post, M. D., Philadelphia, Pa.; Byron C. Darling, M. D., New York, N. Y.; Professor Arrigo Piperno, M. D., Rome, Italy; George W. Mackenzie, M. D., Philadelphia, Pa.; Oskar Weski, M. D., Berlin, Germany; and George R. Satterlee, M. D., Alfred J. Asgis, D. D. S., and E. B. Hardisty, A. B., New York, N. Y.

The first symposium on stomatology published on May 19, 1926, contained fourteen

original papers dealing with the medical, surgical and educational phases of stomatology (dentistry). These were representative of France, Italy, Hungary, England, Poland, Germany and the United States.

Physicians and medical specialists interested in obtaining *complimentary* copies and other information concerning stomatologic subjects will please write to: *European Address*—Dr. A. Herpin, General Secretary, A. S. I., 79 Haussman Boulevard, Paris, France, or Prof. G. Coencagli, 17 Lungotevere Melline, Rome, Itally; *American address*—Dr. Alfred J. Asgis, Adjunct General-Secretary, A. S. I., 40 East 41st Street, New York, N. Y.

THE STUDENT'S LIBRARY

BOOKS RECEIVED

This column is devoted to acknowledgment of the books received. Such acknowledgment must be regarded by the sender as sufficient recognition of the courtesy until time and space permit selections to be made for review.

GOULD'S MEDICAL DICTIONARY. By *George M. Gould,* A. M., M. D. 1398 pp. Illustrated with engravings. Published by P. Blakiston's Son and Co., Philadelphia, Penna.

ULTRA VIOLET RADIATION. By *Eleanor H. Russell,* M. B. B. S. Dunelm, and W. Kerr Russell, M. D., B. S. Dunelm, Hon. Actinotherapist Sun-Ray Clinic, Newcastle-On Tyne Goyder Scholar, University Durham, 1914, late Capt. R. A. M. C. (S. R.) late Surgeon, Special Surgical (Orthopedic) Hospital, Newcastle, late Surgeon, War Pensions Hospital, Castle Leazes, Newcastle-on Tyne. Second Edition, 414 pp., illustrated with engravings. Published by William Wood & Company, New York City.

COMPENDIUM OF REGIONAL DIAGNOSIS. by *Robert Bing,* Professor in the University of Basle, Trans. from the 6th German Edition by *F. S. Arnold,* B. A., M. B., B. Ch. (Oxon.). Third Edition, Pp. 198, with 102 illustrations.

INTERNATIONAL CLINICS. Vol. 1, 37th Series, March 1927, Pp. 297. A Quarterly of Illustrated clinical lectures and especially prepared original articles on, Treatment, Medicine, Surgery, Neurology, Paediatrics, Obstetrics, Gynecology Orthopedics, Pathology, Dermatology, Ophthalmology, Otology, Rhinology, Laryngology, Hygiene, and other topics of interest to students and practitioners. By Leading Members of the Medical Profession Throughout the World. Published by J. B. Lippincott Company, Philadelphia and London, England.

BOOKS REVIEWED

LIGHT TREATMENT IN SURGERY. By *Dr. O. Bernhard.* Translated by *R. King Brown,* B. A., M. D., D. P. H. Cloth, 317 pp. with illustrations, London, Edward Arnold & Company, 1926. Price $7.50.

The translator's preface immediately emphasizes the difficulties encountered by the translator in conveying the spirit and impressions of the original book. Added emphasis is made on the fact that this book advocates measures for the prevention of disease as well as its cure.

The foreword by Leonard Hill is noteworthy. It is he who proclaims the original volume by Bernhard, a masterly production, the fruit of thirty years' work carried out by one of the greatest if not the greatest pioneer of heliotherapy in the high Alps.

An interesting as well as important part of this volume is the historical section. It is truly authoritative and much valuable information can be gleaned from the contents. Light and light biology are also exhaustively treated. Probably the most unique chapter is the one dealing with the pathology of sunlight. Few books contain the concentrated amount of useful information found in so small a number of pages.

Light therapy with artificial sources are not neglected in the exhausfive consideration of the subject of the text. The chapter dealing with climate is of incidental importance, but not more so than the treatise on "Heliotherapy in Surgical Tuberculosis". It is fully descriptive and detailed and well illustrated.

The reviewer has been amply repaid for his time by the enlightment obtained from careful perusal of this important and valuable book. There is no doubt but that light treatment in surgery is just coming to the front. This translation in English will help

systematic English work has for the present at least been ably and adequately answered. The work is a commendable one.

SYMPTOM DIAGNOSIS, REGIONAL AND GENERAL. *Wilfred M. Barton,* A. M., M. D., F. A. C. P. and *Wallace M. Yater,* A. B., M. D., New York and London, D. Appleton and Company, 1927.

In this volume the regional symptoms of the following parts are considered: The Head, The Face, The Eye, The Ear, The Nose, The Lips, The Mouth or Buccal Cavity, The Tongue, The Teeth, The Jaw, The Pharynx or Throat, The Larynx, The Neck, The Upper Extremity, The Thorax or Chest, The Abdomen, The Back and Spine, The Male Genitalia, The Female Genitalia, The Anoperineal Region, The Lower Extremity. There is also a section on General Symptoms and one containing an index.

These parts are again subdivided so that much detail is included under each of the symptoms listed. The book is indeed comprehensive and shows an enormous amount of preparation. Its purpose is threefold: (1) to aid the busy physician in the diagnosis of his case by allowing him to quickly reduce the number of possibilities to a small list; (2) to prevent the oversight of important considerations; (3) to make the medical man more observant of the characteristics of the symptoms of disease.

In a word this volume is not designed for study, but for quick reference. As such it is complete and valuable and an asset in every physician's library.

The section on general symptoms deserves special note.

PRINCIPALS OF DIAGNOSIS AND TREATMENT IN HEART AFFECTIONS. *Sir James Mac Kenzie,* M. D., F. R. S., F. R. C. P., LL. D., Ab & Ed., F. R. C. P. I. (Hon.), Director St. Andrews Institute for Clinical Research, Consulting Physician to the London Hospital; Consulting Physician to H. M. the King in Scotland; and *James Orr,* M. B., Ch. B., Physician to the St. Andrews Institute for Clinical Research. Third Edition. Pp. 242 with 37 illustrations. Cloth. New York: Oxford University Press, 1926.

No greater cardiologist has lived and no greater summarization of the essential principles of cardiology has ever been written than by Sir James MacKenzie.

The first edition of this little book was presented to the medical profession in 1916. Its object was to aid the recognition by the general practitioner of the early signs and appreciation of heart failure, and an attempt to instill in the general practitioner's mind a conception of what clinical medicine means and how clinical investigation should be carried out. That the author was successful was exemplified by the impression that issued from press yearly. A second edition was given in 1923, and a third edition was undertaken by Dr. Orr on the request of Dr. MacKenzie.

Undoubtedly a summarization of the contents of the text is unnecessary, for it occupies a conspicuous position in the working library of practically everyone in the realm of medicine. In the present edition a few changes were made. The original division into four parts was maintained: Heart Failure, Affections of the Regulating Mechanism of the Heart, Affections of the Heart Other than those of the Regulating Mechanism, and Prognosis and Treatment. There has been a condensation of the material, the present author attempting "in preparing the present edition——to make it representative of the newer teaching of its late author, without sacrificing in any way the distinctively clinical character of the original work."

Although Sir James Mackenzie's *Diseases of the Heart* was a master production, no greater monument could have been constructed to live the work and character of the master than this guide for the general practitioner.

THE TRANSPLANTATION OF TISSUES. *Harold Neuhof,* M. D., Instructor in Surgery, Columbia University, College of Physicians and Surgeons; Assoc. Surgeon to Bellevue, Mount Sinai, and Montepiore Hospitals, etc.; with the collaboration of *Samuel Hirshfield,* M. D., Adjunct Surgeon, Mount Sinai Hospital. Cloth. Pp. 297 with 110 illustrations. New York: D. Appleton & Co., 1923.

Inumerable observations and contributions have been made to the subject of transplantation of tissues from the experimental laboratories and clinical wards. No attempts however have been made to correlate these two fields of endeavor in one homogeneous discourse. To our knowledge this is the first volume to extensively consider all varieties of tissue grafts.

Tissue transplantation still remains in the art of surgery. Its practice is ancient and it has developed but little. There has been a great deal of study done

on the subject but the fundamental facts underlying its present practice are few. These the author admirably presents in the first portion of the text. In discussing the general principles of tissue transplantation he calls our attention to the three types of transplants: auto (from self), homo (from same species), and hetero (from another species). Autotransplantation is by far the most successful; and, he asserts, the success of tissue transplantation depends on the fundamental question of viability. He does not agree with Carrel that blood vessel suturing is necessary for viability; and having criticised he offers what has been an adequate procedure in the ten years of his clinical and experimental study.

Having outlined the essential principles of tissue transplantation, the remainder of the text is devoted to the individual characteristics and peculiarities of tissue grafts. Skin and cornea, mucous membrane, fat and peritoneum, fascia, muscle, nerves, bone, cartilage and joints, blood vessels and organs—each are separately detailed. In each section a short resume of the evolution of the work is presented, followed by a discussion of the histology and results obtained in the transplantation of that tissue. The indications, contraindications and technic for transplantation, clinical value, and concrete clinical applications then occupy the major portion of the sections. An extensive bibliography concludes each division and should stimulate further study.

No more comprehensive, exhaustive and authentic dissertation has been offered on the subject of transplantation of tissues.

ATLAS OF DISEASES OF THE SKIN. By *Prof. G. Riehl* and *Prof. Leo. V. Zumbusch*. With diagnostic and therapeutic notes by *John B. Ludy*, A. M., M. D., Col. Med. O. R. C., U. S. Army, Dermatologist to the Lankenau and Methodist Hospitals, Philadelphia, etc. Three volumes. 195 illustrations. Fabricoid, embossed. Price $25.00. Philidelphia: P. Blakiston's Son & Co., 1925.

The original material comprising this work was taken from the dermatological clinics of the authors and the illustrations are reproductions from life in colors by a Farben photo-engraving process. The photos are very lifelike.

The *Atlas* has been divided into three volumes. In the first volume a reproduction of the infectious diseases of the skin are depicted in 69 of the colored illustrations. In the second volume, inflammatory diseases of the skin are illustrated. In the third volume atrophies, new formations and hypertrophies are shown in 61 engravings.

The translation and reproduction of this German work has been supplemented by an American author. Dr. Ludy has prepared a short diagnostic and therapeutic discussion to accompany each of the illustrated conditions. This discussion has no pretense of being complete but is simply a brief outline of the essential diagnostic and therapeutic considerations to be remembered in reviewing the condition under question. His reminders are timely.

Certainly such a combination should do much towards assisting those who have not had the opportunity of extensive dermatological observation. The student and general practitioner are those who should receive the most benefit from such a combined study.

THE SEXUAL QUESTION. A Scientific, Psychological, Hygienic and Sociological Study. By *August Forel*, M. D., Ph. D., LL. D., Formerly Prof. Psychiatry at and Director of the Insane Asylum in Zurich, Switzerland. English adaptation from the second German edition, revised and enlarged by *C. F. Marshall*, M. D., F. R. C. S., Assistant Surgeon to the Hospital for diseases of Skin, London. Cloth. Pp. 536 with 23 illustrations. Price $5.00. New York: Physicians and Surgeons Book Co., 1926.

A study of the sexual question is a study of life itself with all its ramifications. There are two main objectives of each individual's existance—self protection and self preservation. From these fundamental motives all activities radiate and are secondary manifestations. To attempt to analyze these various manifestations of human greed and arrive at the basic underlying principle of life, probably the sex question, is no small task. Taking individuals who carry on a satisfactory, respectable existance in the eyes of others as normal and assuming variations fro mthis accepted normal as being assuming variations from this accepted normal as being abnormalcies and classify them. Yet we are accepting an artificiality, essentially an abnormality, a so-called cultured, and altered psychological, hygienic and sociological individual as our standard for comparison.

The author begins his presentation with devoting time to a discussion of the natural history and psychology of sexual life. He explains the simplest form of reproduction, cellular division by parthenogenesis,

before entering into the more complex maturation that takes place in the development of the human embryo. The anatomy and physiology of the sexual organs are briefly discussed. The manifestations of this sexual physiology in the form of love, sentiment, passion, etc., are detailed. The author then enters into the history of the sexual life in marriage customs and evolution of the sex appetite. The abnormalities follow. Such pathological conditions as sadicism, masochism, influence of narcotics, etc., are discussed. Religion, social and civil laws are manifestations of an attempt to control this sex appetite. In the chapter on sexual morality there is freedom of speech. It is courageously written and is free from all sensualities, sentimentalities and pruderies.

An opinion of such an authority as Dr. Forel is valuable. There are no limitations that he has placed upon the expression of this opinion in this text.

TRAUMATIC SHOCK. *Walter B. Cannon,* A. M., M. D., Lately Lieutenant Colonel Medical Corps, U. S. A.; *George Higginson,* Professor of Physiology, Harvard Medical School, etc. New York: D. Appleton & Co., 1923.

Traumatic shock is one of the most intensively studied complications of surgery and is the one, we are safe to say, about which we understand the least. A tremendous amount of work has been devoted to the study of this condition known as shock, the World War having offered an abundance of material for clinical observation and treatment. The author of this monograph, Dr. Walter B. Cannon, has devoted as much time and is as well or better versed upon the condition known as shock as anyone who has made a study of the subject.

In this little monograph the benefits of his experiences on the battle fields and in the research laboratories are combined with the observations made by other students of the entity.

Shock he divided according to Cowell into primary and secondary shock. Their time of occurence and etiological factors are chief distinguishing elements. Their general symptomatology vary but little. In shock, the patient usually after severe injury presents a dulled, apathetic, indifferent mental state; his skin is cold and clammy; his muscles are relaxed, and there is a lessened sensibility; his lips are pale and there is a cyanotic appearance of the skin; his respirations are superficial and rapid; his pulse rapid and thready; his blood pressure has fallen. Such a condition may be the result of nervous disturbance, hemorrhage or infection. The theories of shock are numerous and varied. Much time is devoted to their consideration. The treatment of shock depends upon the condition of the patient. In brief, hemorrhage should be immediately controlled, the body should be kept warm my means of hot water bottles, blankets, etc., and the pain and restlessness should be kept to the minimum. Posture influences the low blood pressure. Vasoconstrictor drugs, intravenous salt, hypodermoclysis etc. give but temporary relief. The body fluids should be restored by mouth, or if vomited, by proctoclysis. A hypertonic gum acacia and glucose solution, 25 and 18 per cent respectively, have been found to be valuable. In experimental animals if given slowly, gum acacia was found to be entirely innocuous. The solution was given at the rate of 5 c. c. per kilogram per hour. The same conditions hold for humans, 500 to 750 c. c. being over an hours' interval having demonstrated distinct benefit. Transfusion did not seem to have any marked benefit over the gum acacia method.

For a comprehensive survey of the subject, no better authority could have ben chosen nor presented the material in a more complete and comprehensive manner than Dr. Walter B. Cannon. He deserves credit for such a publication.

PSYCHOPATHIA SEXUALIS. *Dr. R. V. Krafft-Ebing,* O. O. Prof. fur Psychiatrie und Nervenkrankheiten an der K. K. Universitat Wein. Only authorized English adaption of the twelfth German edition by *F. J. Rebman.* Cloth. Pp. 617. New York: (Physicians and Surgeons Book Co., 1925.

In the preface of the first edition of this work published by the author back in 1920 it was stated that the object of this treatise was merely to record the various psychopathological manifestations of sexual life in man to reduce them to their lawful conditions.

That his efforts met with the approval of the medical and legal professions is accorded in the fact that the twelfth edition appeared in 1925. It differs from the previous editions in that case reports have been magnified and the illustrations have been omitted. The number of technical terms and Latin language has been increased to discourage any attempt on the part of the lay mind to conceive the text.

In the preparation of this twelfth edition, the writer completed his life task—the devotion of his life to the

study of psychopathia sexualis and its relation to forensic medicine. The contents was divided into five main divisions. In discussing the psychology of sexual life, the force of sexual instinct, love as a passion, sensuality and morality, true love, sentimentality, friendship, matrimony, fetichism, etc., are all presented in an admirable manner. The physiological facts, particularly of sexual life, play a big role in the life of an individual. Certain anthropological facts exist. Deviation from the ordinary role of sexual life and daily activity is termed pathological. The reviewer wonders where to draw the line between normal and abnormal. The general (neurological and psychological) and special pathology consumes the bulk of the text. These various variations are finally related to the pathological sexual life before the criminal forum.

It is not easy to read such a work; but it should be once read before studied. In attempting to conceive the scope included by the writer, it would be the best plan to read through the text before attempting an analysis of its parts. One will appreciate the thoroughness of the work that has consumed directly the life efforts of one man combined with the amalgamated principles of many other students of psychopathology, after he has studied and analyzed the apparently enormous variations that depend upon such a slight deviation from the recognized normal.

TRAUMATIC INJURIES OF THE CARPUS. *Kellogg Speed,* S. B., M. D., F. A. C. S., Assist. Prof. Clin. Surgery, Rush Medical College; Assoc. Attending Surgeon Presbyterian Hosp., Chicago; Attending Surgeon, Cook County Hosp. Under Editorial supervision of *Dean Lewis, Eugene Pool, Arthur Elting.* Cloth. Pp. 197 with 164 illustrations. New York: D. Appleton & Co., 1925.

The title of the monograph is misleading. It would have been better to have accredited to Dr. Speed a monograph on injuries of the wrist.

In the presentation of the various injuries of the wrist, the material has been divided into two parts. The first portion of the text is admirably devoted to the discussion of the commonest of all fractures of the carpal bones if not the body—Colles' fracture. Attacking this subject in the most logical manner he considers anatomy, etiology, pathology, symptomatology, prognosis and treatment in order. His presentation is clear, concise, beautifully illustrated, and most definite.

Although Colles' fracture is the most frequent fracture of the wrist, fractures or dislocations of other carpal bones should be given careful consideration when an injured wrist is presented. Such injuries are easily overlooked and when recognized are not simple to treat. Using the same manner of atatck the author develops the second portion of his monograph, fractures and dislocations of the carpal bones. Lucid descriptions of the manner of receipt, resulting pathology, character of the deformity and method of treatment are given. Each questionable point is developed to its maximum and drawings are used to depict and vivify the procedure. The x ray plays an important part in the diagnostic role of carpal injuries to a much higher degree than it does in Colles' fractures.

Dr. Speed has presented his subject in such a thorough and definite, yet simplex style that it should be of value to the profession.

A MANUAL OF TOXICOLOGY. *Albert H. Brundage,* A. M., M. D., Phar. D. M. S., Medical Inspector and Lecturer, Dept. Health, City of New York; Major Medical Staff, Police Reserve, City of New York; Examining Surgeon and Secretary, Board of Examining Surgeons, U. S. Bureau of pensions; Assistant in Immunology Polhemus Clinic, Long Island College Hospital, etc. Pp. 444. New. York: D. Appleton & Co., 1926.

The presentation of such an important subject in such a thorough yet clear and concise manner accounts for the commendation it has received at the hands of the medical profession. This, the fifteenth edition of the text covers a wide scope and presents information in a manner valuable to physician, pharmacist and student.

The contents is divided into twelve parts. In the first portion the effects of and classification of poisons, the mechanical, chemical and physiological antidotes for poisons are discussed. In alphabetical sequence the various poisons are arranged in the second division. History, symptoms and treatment of acute and chronic poisoning for each drug is given. This is followed by a charted, digested key to treatment , and a key of the constituents of the various patent, proprietary and general preparations. A valuable aid to the diagnosis of the poison taken constitutes the third part of the text. Here by symptoms the various poisons to be suspected are itemized. Special mention is made of their effect upon the special senses, various charts being included so as to carry out vision tests and instructions given for the hearing, tactile, temperature and pressure tests. It is necessary to differentiate poison drugs and posoning from auto-intoxication or disease processes. This is admirably accomplished in the

fourth dvision. An epitome of some of the principal tests for the identfication of poison follows. In a sixth section an outline of procedure in searching for poisons is offered. A seventh portion deals with the signs and causes of death from poisons, Pharmacological toxicology, feeding in poisoning, guide to postmortem procedures and a discussion of chronic poisoning and drug habits constitute the remainder of the text.

Unique for its compactness, and conciseness, yet thoroughness and breadth of scope, this manual should be in the hands of every practitioner.

INTERNATIONAL ABSTRACTS

Report of 5000 Gastro-Intestinal Examinations by the Roentgen Ray. A. S. Merrill, M. D., Am. J. Roentgenol., 14:320-319, October, 1925.

This report from the department of roentgenology of the Massachusetts General Hospital demonstrates the applicability of the roentgen ray in gastro-intestinal diagnoses when in reliable hands. The reproduction of his summary will suffice.

Proven error in 818 cases explored is approximately 4 per cent. Positive error in making diagnosis of disease when none was found at operation was 1.2 per cent.

Of the 2176 cases roentgenologically negative only 117 were explored. This may indicate confidence in the roentgen findings, conservatism of the patient or mildness of symptoms.

No gastric ulcer nor cancer found at operation was missed by the roentgen ray. Two duodenal ulcers were missed.

In a certain number of cases of gallbladder disease the observer was content to report a negative gastro-intestinal tract, either overlooking or not recording the suggestive signs of gallbladder disease. More attention is now being paid to these signs. The cases of disease of the colon missed illustrate the importance of following the routine examination by examination of the colon with opaque enema in questionable cases.

In 551 cases showing roentgenologically ptosis only, a clinical diagnosis of peptic ulcer had been made in 28 per cent and a diagnosis of cancer in 8 per cent. Presumably the gastric symptoms in these cases are due to reflex causes with or without hyperacidity. Yet ptosis and ulcer coexist in many cases.

In duodenal ulcers the roentgen findings were confirmed in 92 per cent of the cases. Only 22 of the cases of duodenal ulcer came to operation so far as we know ,suggesting milder symptoms as compared with gastric ulcer, 40 per cent of which were known to have been operated upon.

Only about one-half of the duodenal ulcers correctly diagnosed by the roentgen ray had been recognized clinically.

Reflex irritation or spasm may cause any of the abnormalties upon which the diagnosis of duodenal ulcer is based and is the most frequent cause of error.

In gastric ulcer the findings were confirmed in 93 per cent. The correct clinical diagnosis was made in 56 per cent.

In gastric cancer the results were correct in 95 out of 97 cases operated upon, and one of the two errors could have been avoided if the history of swallowing of corrosive had not been withheld. The clinical diagnosis was right or nearly so in 55 cases.

Pyloric obstruction was correctly diagnosed in all of 32 cases operated upon. Even at operation it was impossible to make further pathological diagnosis.

Disease of the appendix was indicated by the roentgen ray in 372 cases. As only 35 of these are known to have been operated upon we may suspect that the disease was rarely acute. Out of 35 cases the diagnosis made roentgenologically was confirmed in 34. Fourteen of these had been diagnosed clinically. There are no pathognomonic roentgen signs, and the conditions most frequently confusing the diagnosis are gallbladder disease and gynecological pathology.

In 34 explored cases of gallbladder disease out of 171 cases so suggested by the roentgen ray the roentgenological diagnosis was confirmed in 32.

The roentgen diagnosis in eosophageal conditions was confirmed in all cases by esophageal examination or operation. Clinically 18 out of 70 cases of obstruction were not recognized. Cardiospasm, 13 cases, and diverticulum, 6 cases, were diagnosed as such clinically. The usual diagnosis was obstruction . The former has been proven by Mosher to be often stricture in the liver tunnel and not spasm. On the other hand, in 24 of 35 cases roentgenologically negative, a clinical diagnosis of esophageal obstruction had been made.

No proven case of gastric syphilis came to light in this series.

Forty-seven out of 51 cases as adhesions were confirmed at operation.

Diseases of the small intestine unaccompanied by definite changes in the lumen or obstruction had few or no signs.

The large bowel should be examined by enema after thorough cleansing out, and even then pathology that does not effect the lumen to some extent may be overlooked.

Investigations of the Action of Light on Oxygen Consumption. Carl Sonne. Acta Radiol., 5:418-456 October, 1926.

Radiation with strong light energy—ranging from about 0.02 to about 1.00 gram caloric per minute and per square centimeter—of certain light qualities has a considerable accelerating influence of the oxygen consumption by the chrysalids of the meal-worm.

The effect is greater the shorter the wave lengths applied since an increase in oxygen consumption of 40 per cent was found at exposure for forty-five minutes to the unfiltered light of Kromayer lamp, about 20 per cent was found when a glass filter was used ,about 10 per cent was found with a glass filter and a methylene blue filter, and about 0 per cent was found with a glass filter and a potassium bichromate filter. Thus the yellow light has no influence on the respiratory exchange.

Within the range of the intensities applied in the radiation experiments no difference of effect could be detected, no matter whether a stronger or a weaker radiation of the same type of light was employed.

Subsequent to radiation with the unfiltered light an increase of the oxygen absorption of about 1.5 per cent on the average, was established to persist for a lengthened period in nearly all tests. In all cases where it was examined, this increase was kept at the same level several hours after the discontinuance of the radiation. In the experiments with filtered light, in which the essential portion of the ultra violet frequencies are cut off, no after effect on metabolism could be detected.

The pupae, which had been exposed to the unfiltered light, presented a blackish pigmentation on the day following the experiment, and died in the course of a few days, while the animals which had been exposed to the other types of radiation would continue their development undisturbed.

Surviving tissue from a pupa, obtained by removing with a pair of pincers the major part of the soft tissue from freshly killed pupa proved, presumably owing to the presence of plenty of muscular cells on the inside of the pupal skin, to have an oxygen consumption of the same order as a live pupa. This oxygen absorption in the surviving tissue reacted to changes in temperature in a similar way as in the live animal, while the metabolic processes in the pupal skin did not react to a radiation which, in the living pupa, produced an increase in metabolism

Therefore, it is assumed that the accelerating action on metabolism produced by light in the living pupa depends on the presence of nervous or vascular tracts, being thus due to radical changes in the organism, which may perhaps be correlated with the well known effect of light on the mineral metabolism.

The Static Current in the Treatment of Inflammation, By W. B. Snow, M. D., Medical Journal and Record, Dec. 15, 1926.

There are two distinctive groups of inflammatory conditions, those designated by Adams as simple, in other words, those in which there is no infection, and those associated with a process of infection. There might be a third class added, namely. those arising from disturbed metabolism. The author's early discoveries are largely responsible for the development of the static methods of treatment. The peculiar effects of the static current are derived from the fact that it is a direct or constant current of high potential and therefore possesses the characteristic qualities of the constant current in inducing direct muscular contraction of the muscle cells.

The effects of the static current important in therapeutics are: (a) The mechanical removal of infiltration from engorged tissues where no infection is present. (b) It produces a complete relief of tense muscles when applied, thereby overcoming muscular

contraction associated with the inflammatory process. (c) With the general administration of the one pole modality, it has a remarkable effect in improving local and general metabolism.

There is no other electrical current at present available possessing the same characteristics and capable of the same therapeutic effects as the static modalities, and ,from the fact that it is so remarkable in its influence upon inflammatory conditions, it is indispensable for prompt and complete relief of those conditions.

Irradiation of Vesical Neoplasms by Removable Platinum Radon Seeds: Description of New Instruments Designed to Facilitate their Employment. Joseph Muir, Jour. Urology, January 1927, XVII, p. 53.

An improved method of treating neoplasms of the bladder by means of removable platinum radon seeds as described in this article.

Using the removable platinum radon seed it is possible to obtain scientific accuracy of the dosage delivered. Radiation is directed not only to the growth itself, but to the tissue surrounding it, in order to catch the mitotic cell. The placement of the radioactive units is made so that the "zones of potential tissue change" from each source do not overlap. The "zone of potential tissue change", or the amount of tissue that one seed can take care of when implanted alone and also when two or three centers are used so that intervening cells are subjected to cross firing, is described. The theoretical expose has been proven by clinical results.

Using the removable platinum radon seed not only are we able to deliver accurate dosage. but because of the platinum screenage all caustic rays are eliminated and necrosis and sloughing with intense shock to the patient obviated. The fact that platinum radon seeds are easily removed thru the cystoscope after the required amount of radiation has been delivered makes this the method of choice since no foreign body is left in the tissue after treatment.

The technic of application is fully described and illustrated. A point of great importance in using the removable platinum radon seeds is that after the first seed has been implanted thru the cystoscope, its thread protruding from the portal of entry of the seed in tissue serves as a landmark and guide for the placement of successive seeds, so that the accuracy of placement seeds thru the cystoscope is greatly increased. Also, should a seed be incorrectly implanted, it may be removed and reimplanted.

In view of the highly simplified technic as described, the treatment of vesical neoplasms by implantation of removable platinum radon seeds can be accomplished with as much scientific accuracy as any other urologic procedure.

The Diagnosis of Peptic Ulcer by X Ray, Ernest L. Davis, Boston M. and S. J., Nov. 18, 1926.

The accuracy of the diagnosis of peptic ulcer varies with the ability and training of the examiner. The diagnosis of the average Roentgenologist should be from 75 to 80 per cent correct.

Peptic ulcer can be diagnosed positively by x ray when it is located in the stomach so that a niche or an accessory pocket can be visualized and an ulcer in the duodenum can be positively determined when the characteristic deformity of the bulb is shown constant and unvarying. The site of the ulcer is of more importance in its visualization than its size. Peptic ulcer may exist without showing any direct x ray evidence, but there may be indirect signs that may be corroborative of clinical diagnosis. The x ray interpretation of shadows and signs must be consistent with the clinical findings, history, it is insisted, being of great importance.

To quote Dr. Russell D. Carman, "The Roentgenological examination of the digestive tract is not a mysterious art requiring extraordinary talents. Neither is it a simple diagnostic method which can be learned in a day. Its successful employment demands industry, experience, judgment and care, just as any other procedure in medicine, no more, no less."

Ultra Violet Rays and Vitamins, Herman Vollmer, Ztschr f. Kinderheilkunde, Feb. 1926.

Twin sisters raised under identical conditions up to the age of 26 months were brought to the clinic, both being markedly rachitic. They were placed in the same room and given a diet poor in vitamins, plus ultra violet irradiations combined fith eosin sensitization (1.0 gram of bluish eosin daily). After 17 days the raying of one child was stoped and she was given a diet rich in vitamins. The other continued to receive the rayings and the vitamin-poor diet. Both children continued to improve, but the one who received the ultra violet treatments progressed more rapidly.

Roentgenograms showed beginning calcification of the bones within a week after the raying was commenced. Healing is more rapid with the use of ultra violet alone than with vitamins alone, and the rays seem to be necessary to start the healing process.

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